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THE MONTH

COUGHS and colds are still the hallmark of our British winter. Science may have reduced the toll of lives from acute infections, but the chronic bronchitics and asthmatics are still with us. The extent to which the acute infections have been brought under control is well summarized in our symposium on 'Respiratory disorders' this month by Dr. Kenneth Robson and Dr. Lloyd Rusby in their articles on 'Acute bronchitis' and 'The treatment of pneumonia'. In his article on 'The care of the chronic asthmatic in winter', Dr. J. L. Livingstone shows how much can be done to help these unfortunates, whilst Dr. Ian W. B. Grant provides an authoritative and up-to-date account of 'The use of aerosols in respiratory disease'. The last two articles in the symposium—'The prevention and care of respiratory infections in the newborn' by Dr. J. O. Forfar, and 'The prevention and care of respiratory infections in the elderly' by Dr. Trevor Howell—deal with the special problem of respiratory infections at the two extremes of life.

The Symposium

WHAT can only be described as a brilliant piece of special pleading in defence of the National Health Service is to be found in Professor R. M. Titmuss' latest book: 'Essays on "The Welfare State" ' (London: George Allen and Unwin Ltd., 1958. Price 20*s*.). This consists of ten lectures, and it is the last three which are deserving of particular attention. They were delivered at Yale University last year and were intended to give Americans an unbiased and authoritative review of the Service.

As Others See Us

Carefully documented with copious references to statements and speeches by leading officials of the British Medical Association, as well as Government publications, it presents a picture of the Service which will give many practitioners 'furiously to think'. Apparently the vast majority of general practitioners are better off than they ever were before, have less to do and are receiving more remuneration than they did in the bad old pre-1948 days. They have, for instance, a 'generous superannuation' scheme: a general practitioner, retiring after forty years, who has had an average of 2000 patients, will receive an annual pension of £1000 a year plus a tax-free lump

sum retiring allowance of £2,800. At the same time inter-professional rivalries are emphasized—some would say magnified, a leading member of the British Medical Association being quoted in support of the dogmatic statement that the general practitioner 'was assumed, by consultants, to be something of a mediocrity'. Perhaps it is not unfair criticism of Professor Titmuss' views on the Service to wonder whether they can carry any more weight than his inclusion of the use of anticoagulants in the treatment of coronary thrombosis as being an advance in the same category as antibiotics and radioactive isotopes. Be that as it may, this publication from the London School of Economics will undoubtedly be studied by many laymen, including politicians, and it is therefore incumbent upon thoughtful doctors to be aware of the views that are being published in favour of the Service.

Medical Records

THE exhibition of medical records, which is being held in the library of the Royal College of Physicians in conjunction with the annual conference of the British Records Association, is a welcome demonstration of the valiant efforts being made to preserve the records, or archives, of hospitals and all aspects of medicine throughout the ages. The Association has been remarkably successful in its efforts to preserve English Records and it is largely through its activities that local authorities, private and ecclesiastical institutions and private individuals have been stimulated, and assisted, to preserve the records in their possession.

The exhibition at the Royal College of Physicians, which is to remain open until December 12, covers a period of nearly four centuries—from the foundation of the College, in 1518, to the passing of the Medical Act in 1858. It provides a wealth of fascinating material. There is, for instance, the earliest subscription book of the archdeaconry of Chichester, showing the subscription of Elizabeth Strudwicke, of Kirdford, who was licensed to practice as a surgeon in 1673. The articles of partnership, drawn up in July 1777, between Joseph Crewe, apothecary, and Job Harrison, apothecary surgeon and man midwife, both of Chester, are an interesting commentary on the type of practice at the end of the eighteenth century. The agreement was for twelve years, during the first five of which Crewe was to have two-thirds of the profits, whilst for the remainder of the period the profits were to be equally shared between the two partners. Harrison, however, was to be responsible for all the night work. Paper work obviously is no new feature of medical practice. One of the exhibits is a surgeon's bill which covers twenty pages. Made out to the Hon. Maurice Shelton, it gives details of treatment of himself and members of his family for the year 1726-27. The sum involved is £131 3*s.* 11½*d.*, to which is added £62 11*s.* 10½*d.* 'left to pay of ye old Bill'. That the practice of medicine could be lucrative is demonstrated by the ledger of Sir Henry Halford (1766-1844). In 1806, for instance, his income was £7,789, which included £100 paid by the executors of Charles

James Fox. These random samples, chosen from the sixty-five exhibits, give some idea of the wealth of material which is on display and which will appeal to all who are interested in the history of medicine in these Islands.

Private Practice Insurance

ONE of the most interesting features of the first ten years of the National Health Service has been the popularity of insurance schemes to cover consultant and nursing-home services. These have grown to an extent entirely unforeseen by even their most enthusiastic advocates. The logical sequel to this was a scheme to cover the cost of private treatment given by a general practitioner. To devise such a scheme that would be both solvent and attractive to the subscriber has proved difficult, but the British United Provident Association has now announced that these difficulties have been overcome and that it proposes to introduce a general-practitioner scheme for those who are already members of, or who join, their Standard Scheme.

As the main object is to help as much as possible with long illnesses, the first few items of service in each year are excluded from coverage, and it has not yet proved possible to include the cost of drugs. As an example of how the scheme will work, the case of a single subscriber may be quoted. His subscription will be £2 10*s*. a year. For this, excluding the first two consultations, he will be entitled to benefit towards the fees of his general practitioner up to 12*s*. 6*d*. per attendance, the maximum payment for any one year being restricted to £50. Whilst the B.U.P.A. is the first in the field with a definite scheme, the Western Provident Association has announced that it also is considering an extension of its scheme to cover general practice. All who consider that the maintenance of private practice is essential for the future well-being of medicine will welcome this move and hope that it will have the same success as the now well-established consultant and nursing-home scheme.

Spelæan Diseases

'CAVING is a healthy activity, and most cavers are in robust health', according to Dr. W. R. Halliday, the chairman of the medical committee of the United States National Speleological Society (*GP* (*Kansas*), 1958, **18**, 80), but American cave explorers seem to be exposed to certain medical hazards that are unlikely to worry their British counterparts. Dr. Halliday discusses three 'diseases inherent in American caves': cave dust pneumonitis, acute histoplasmosis, and rabies. The first of these is described as 'a mild, common and apparently wholly benign syndrome resulting from inhalation of considerable quantities of dust in dry caves'. It is characterized by mild pleuritic pain and dyspnœa and a dry, or slightly productive, rasping cough beginning a few minutes or

hours after exposure to an excessively dusty cave, and lasting a few hours or days. It is probably irritative or allergic in origin.

Acute histoplasmosis is a more serious condition and is a particular hazard in certain caves in Venezuela, Peru, Mexico, and South Africa. It carries a mortality of about 1 per cent., but no deaths have been recorded among United States citizens. Several epidemics have been reported among cave explorers, and these have been associated with a concentration of avian excreta, or of bat guano. The incubation period varies from four to over fourteen days and the illness may drag on for several months. Insectivorous bats form a reservoir of rabies in the United States and it is they who may be responsible for infecting the modern cave-man. According to Dr. Halliday, in the speleological literature, public health authorities have reported two deaths in 15 attacks on human beings by rabid bats. The risk, though slight, is apparently being taken seriously and Dr. Halliday reports that immunization against rabies has been instituted in several local units of the National Speleological Society.

Medical Saints

HAGIOLOGY is one of the more neglected branches of medical history. So much so that there can be few doctors who are aware of the wealth of fascinating information that exists on the subject. Indeed, the number of medical saints is such that many diseases can claim the patronage of more than one. Those interested in this intriguing by-way of medicine will find an admirable review of the subject in an article on 'The Saints of Medicine', by Edward L. Murphy (*J. Irish med. Ass.*, 1958, **43** 257). What adds to the interest, if confusion, of the subject, is the fact that not infrequently there is more than one saint of the same name. Thus it is St. Anthony of Egypt (251-356) whose name is associated with ergotism and erysipelas, but it is a much later namesake—St. Anthony of Padua (1195-1231)—who is one of the patron saints of pregnancy. Incidentally he is also invoked for the recovery of lost property and the safe delivery of correspondence.

Rheumatologists will probably be surprised at the number of saints whom they can invoke. St. Laurence is the patron saint of the victims of backache, St. Dometius protects those with sciatica. St. Maurus is on call for the gouty, whilst for rheumatic victims in general there is St. Gervase. Dermatologists are also well served. There are, for instance, St. Amand for eczema, St. Aignan for ringworm and, more generally known, St. Main for pruritus. It was this last association that was responsible for scabies being known as 'St. Main's evil' in the Middle Ages. Renal disease is not well represented with the exception of St. Benedict, the founder of Monte Cassino, who is the patron saint of those with urinary calculi. These are but a selection of the many saints associated with our profession, but they give some indication of the extent to which hagiology and medicine have become interwoven throughout the ages.

ACUTE BRONCHITIS

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A REFERENCE to the textbooks, editions old and new, suggests that our concept of acute bronchitis has not changed much over thirty years. Here and there are differences of emphasis: for instance there is less tendency nowadays to describe as separate entities plastic bronchitis, catarrhal bronchitis and purulent bronchitis and more tendency to regard these as different responses to, or manifestations of, a similar pathological process.

INCIDENCE

Acute bronchitis is met with at all ages, with its highest incidence at the extremes of life (when it is also at its most formidable), in the very young and the late middle-aged and elderly. It accounted for 1,697 male deaths and 1,859 female deaths in 1955. There is thus not the same preponderance of male cases as is seen in chronic bronchitis for which the comparable figures are 16,519 men and 6,617 women. The young are especially vulnerable because of the relatively small calibre of their trachea and bronchial tubes and the middle-aged and elderly because of the frequent presence of intercurrent lung disease and because the passage of years has taken its toll of the myocardium. Acute bronchitis merges into broncho-pneumonia and this is particularly liable to happen in infants. Despite all advances in therapy, capillary bronchitis in the very young remains a serious threat to life.

ETIOLOGY

Different views may be taken concerning the importance of bacteria and bacterial invasion in the etiology of bronchitis. Organisms which may at one time or another be implicated in acute bronchitis are pneumococci, *Streptococcus viridans*, non-hæmolytic streptococci, *Hæmophilus influenzæ* and staphylococci. One would tend to discount the causative role of such organisms but they may be recovered from the sputum or even more directly in some instances. Occasionally acute bronchitis appears to start with coryza but it seems dubious whether we should assign a genuinely causative role to a virus. The occurrence of acute bronchitis in epidemic form is evidence of a common cause for an attack in several people and in such cases it may reasonably be assumed that there is a causative organism common to them all. In all cases it is wise to observe certain precautions during the loose stage of a bronchitic attack. There is an exposure risk, particularly perhaps for a young child, by being in close contact with other cases whether child or adult.

PREDISPOSING FACTORS

There is no doubt that certain individuals are predisposed by various circumstances to attacks of acute bronchitis. In young children such pre-

disposing factors are poor nutrition and a failure to thrive generally. Others seem to have almost a congenitally weak bronchial mucosa. In older subjects the predisposing factors are emphysema and intercurrent respiratory diseases of all sorts (including pulmonary tuberculosis or the scars resulting from its healing). As we are now beginning to see, various surgical procedures, particularly resections, are also of importance. This is not to deny the great benefit that extirpation of pulmonary and bronchial disease confers on a patient or to say that the risk of predisposition to bronchitis is not one which should be accepted. The fact remains, however, that, looked at from the viewpoint of the anatomical and physiological norm of the bronchial tree, the individual who has had a resection is often no better off than he or she in whom distortion of bronchial tubes with abnormal kinking and angulation has resulted from scarring in the healing of pulmonary tuberculosis or other inflammatory conditions.

Predisposition apart, it is probable that a variety of circumstances may pave the way to the acute attack. Thus, climatic factors are of considerable importance, particularly in elderly people. To go from the cosy comfort of a warm room to the raw damp air of a November night with wisps of fog about is to invite trouble. There is thus a factor concerned with temperature, one concerned with rawness or dampness and yet another concerned with air pollution. If the air pollution is heavy, or even if it is light but the contact with it is of some duration, the consequences may be very serious indeed. Once an individual has had an attack of bronchitis during the winter months he is very liable to have a repetition of it and to do so with provocation a good deal less than that which initiated the original attack. After an attack the bronchial mucosa remains in a vulnerable and easily irritated state and in this partially recovered state the cycle of inflammatory change that characterizes the acute attack can be set going by a relatively mildly inclement spell of weather or thermal conditions, or by fog. Nor must general anæsthesia be forgotten as an occasional precipitating factor.

PATHOLOGY

The opportunity to examine, post-mortem, cases of acute bronchitis does not often present itself. It may be inferred that following upon the atmospheric insult to the trachea and main bronchi the way is paved for bacterial invasion and in a short while an inflammatory exudate appears. There is a rise of body temperature and this, together with the local inflammatory reaction, has important repercussions on the normal defensive mechanisms of the respiratory tract. Ciliary action is slowed down and eventually inhibited by fever or by altered hydrogen-ion concentration in the blood. The secretion of mucus is changed in amount and the mucus itself in composition and consistency, often becoming more viscid and glairy. These changes in connexion with ciliary action and mucus are particularly liable to take place following certain forms of general anæsthesia. In any case, however they are brought about, both these happenings have far-reaching

results. Within a few hours the aspect of a patient may change radically for the worse, cyanosis appears and there may even be a fatal outcome, particularly in children if the trachea becomes obstructed.

DIAGNOSIS

Acute bronchitis is one of the conditions which it is the clinician's birthright to diagnose. Radiography offers no direct help unless it be to emphasize underlying structural disease or scarring or to demonstrate focal shadowing which serves to indicate that the condition has progressed beyond the stage of bronchitis. The onset is often acute although there may be a slow build up. Sore throat may be experienced a few hours before an individual is aware that he or she is definitely ill. Something near a rigor sometimes takes place. When the condition is established the patient appears flushed and is dyspnœic, the breathing sometimes having the pattern of an asthmatic attack. This is especially liable to be the case if there have been antecedent attacks of bronchitis, thus offering an opportunity for a patient to become sensitized to some product of an organism. The temperature is raised and the pulse rapid. There is often an irritating dry cough. Physical examination shows some increase in the respiratory rate with rather shallow breathing. There is little alteration in the percussion note but sometimes rhonchial fremitus is palpable. Auscultation reveals rhonchi, varying in pitch but generally being in the upper ranges of the musical scale. Prolonged expiration is not of itself a feature of acute bronchitis but may be encountered if there is superadded bronchial spasm. In this case prolonged expiration is often accompanied by a wheezing musical rhonchus. In bronchitis it is not usual to hear râles other than those which disappear on fuller ventilation when the patient is instructed to cough.

GENERAL TREATMENT

If the concept of acute bronchitis has altered but little over the years the same cannot be said for treatment. This has passed through various phases, now one aspect being emphasized, now another. Gone are the wines of antimony and ipecacuanha, the hot foot-baths and the mustard plaster, the wet pack and the compress to the thorax. Perhaps some of these should not be cast aside too lightheartedly. Patients who have experienced cupping (still carried out sometimes on the Continent) or a hot foot-bath testify to the comfort that these measures may bring.

Considering the condition in adults, the sooner they give up work and accept the fact that getting well is going to be their whole-time occupation for a week or so, the better. For patients who are known to be liable to bronchitis and who live in an industrial area where fog is often a hazard throughout the winter months it is a good plan to arrange for one room in the house to be air conditioned, at least to some extent. This can be achieved by means of a small air-purifying plant and the patient should be treated in this room if and when he develops bronchitis. In any case the patient

should be in a warm room and in bed most of the time. Unless it be foggy the window should be open at the top to allow some exchange of air. If the bathroom and lavatory are cold then these rooms should either be warmed or not used. An improvized commode in the bedroom is preferable to a cold lavatory.

Diet.—The diet, in that phrase so dear to the hard-pressed examination candidate, should be 'light but nourishing'. In the acute stage of bronchitis the patient is disinclined to eat much and swallowing may prove a source of irritation causing coughing so that warm foods are preferable and moist rather than dry. There is no contraindication to alcohol if a patient is used to it, but the heavier wines should be avoided. Whisky or brandy can be very useful indeed in helping to promote sleep at night which is often a problem.

INHALATION THERAPY

Some humidification of the atmosphere is often helpful in the acute or even in the later stages of bronchitis. This requires some ingenuity to arrange satisfactorily because steam kettles are very apt either to boil over or to run dry. Criticisms have been levelled at the good old-fashioned steam tent. Many physicians, however, have seen enough of its benefits to be convinced of its efficacy in certain cases and it is well worthy of trial for an individual who is having an unusually uncomfortable time with a dry cough, a tight chest and no expectoration coming away. The tent should be a comprehensive affair going right to the foot of the bed, with a canopy like a fourposter. Some patients find steam inhalations with friar's balsam useful in the acute stage. Others find that the combination with menthol (menthol and benzoin inhalation B.P.C.) gives them a clearer feeling in the head and air passages. Simple linctus or codeine linctus B.P.C. may be given to control a coughing bout or at night, and another homely remedy is blackcurrant tea, half a tumblerful drunk slowly.

CHEMOTHERAPY

During the first few days in acute bronchitis symptomatic measures such as those already outlined should enable the patient to be made comfortable. Some authorities state categorically that antibiotic treatment is not called for in this type of disorder. On the other hand bacterial invasion, if not a primary feature, is highly likely to come in as a secondary one and there is everything to be said for building up a blood level prophylactically. On the whole this consideration outweighs others and if the disturbance is a really acute and widespread one with fever, it is wise to get started with antibiotic treatment on the first or second day. One of the so-called 'wide-spectrum' preparations should be chosen after careful inquiry about the previous use of such substances and the individual tolerance of the patient. Further, an antibiotic should not be persisted in for a single dose after intolerance or marked gastro-intestinal upset has shown itself. Middle-aged and elderly

people with bronchitis are not suitable subjects for experimentation with the newest antibiotic that has come along and in such cases it is best to rely on a well-tried preparation so long as it gives good results. For the time being tetracycline and oxytetracycline are good first choices. Moderate doses only need be given, 0.25 g. six-hourly for three days and then eight-hourly for another three. Sometimes, despite all rational symptomatic measures, a patient's condition deteriorates, and although oxygen is given by some efficient method life seems to be threatened more mechanically than by toxæmia. The expiratory effort on coughing is insufficient to clear the loosened exudate and mucoid debris which accumulates in the upper trachea giving rise to an ominous rattle.

TRACHEOTOMY

It is at this stage, or preferably before the situation has developed to so dire an extent, that the experience of treating acute laryngo-tracheo-bronchitis in children by tracheotomy has pointed to a solution that may be of the greatest help. Tracheotomy (or perhaps tracheostomy conveys a more accurate impression of the procedure) has the advantage that it is possible to remove secretions effectively from the upper trachea and also from the lower part of the trachea and main bronchi as well. It is, of course, an expedient well known to equitationists as a means of improving the wind of an ageing horse.

Elective tracheotomy under local or, when possible, general anæsthesia is carried out and the tracheotomy tube used initially is a rubber one with an inflatable rubber cuff to allow the use of positive-pressure breathing apparatus if required. Secretions are removed with a large catheter attached to a mechanical sucker and to begin with this is done every twenty minutes or so. For the relief of anoxia oxygen can be delivered through a filiform catheter introduced through the tracheotomy tube to just above the carina. If apnœa supervenes a Beaver or similar apparatus can be used temporarily for positive-pressure breathing. It is usually necessary to keep the cuffed tube in for the first week or so by which time it should no longer be necessary to provide for emergency control of the patient's respiration. The tube is then replaced with a fenestrated metal tracheotomy tube in which both inner and outer tubes have a matching fenestration in the superior aspect allowing easy phonation when the external opening is closed by the patient's finger. This is important, as it gives the patient much greater ease in talking and it is a point which patients appreciate greatly. This second (fenestrated) metal tracheotomy tube is kept in position for a variable period but it is often found that six weeks is long enough and the tracheotomy is then allowed to close. This procedure may well be a lifesaving measure in some patients.

I am indebted to Wing Commander J. N. C. Cooke, M.D., M.R.C.P., for some details about the technique and management of tracheotomy.

THE TREATMENT OF PNEUMONIA

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For the purpose of this article the broad division into bacterial and non-bacterial pneumonia will be followed in keeping with the modern classification but I have not attempted to include inflammation due to other causes such as chemical, lipoid or irradiation pneumonia.

BACTERIAL PNEUMONIA

The treatment of this group of pneumonias has become fundamentally a matter of the choice of antibiotic or chemotherapeutic preparation and there are practical advantages in dealing with the subject in this way. The predominant organism involved in the process should be established at the outset in order that treatment can be planned on a rational basis. If laboratory facilities are available a specimen of sputum should be sent as soon as possible for determination of the flora and for sensitivity tests. Treatment should not be delayed while waiting for the result but may require modification in the light of the findings.

THE SULPHONAMIDES IN BACTERIAL PNEUMONIA

The sulphonamides have now largely passed out of fashion on account of the superiority of more recently discovered preparations. For certain infections, however, they still have some value. They are also used prophylactically for the prevention of pneumonic episodes in chronic bronchitis and mitral stenosis. Compounds have lately been synthesized (e.g. sulphamethoxypyridazine ['lederkyn']) which are rapidly absorbed and only slowly excreted; these are convenient for prophylactic purposes in view of the sustained blood level that results. One daily dose of 500 mg. is sufficient.

PENICILLIN IN BACTERIAL PNEUMONIA

Acute lobar pneumonia due to the pneumococcus or streptococcus is now seldom seen in its classical form, but many of the pneumonias encountered in practice are due to these organisms. Both are generally sensitive to penicillin, and in a report on the treatment of pneumonia the Medical Research Council (1951) recommended its use in the first instance in preference to the newer antibiotics. The conventional dose of 500,000 units of benzylpenicillin twice a day, or of 600,000 units of procaine penicillin once a day, will bring most of these infections quickly under control. Treatment should be continued for forty-eight hours after the temperature has returned to normal or the organism is no longer present in the sputum in pure culture.

Penicillin can usefully be combined with *streptomycin*; these two antibiotics harmonize well and the addition of streptomycin will extend the antibiotic range to include some organisms insensitive to penicillin.

Streptomycin, 1 g. twice a day during the short period generally required, can be given without fear of complications except in elderly patients with arteriosclerotic changes or in those with damaged kidneys.

Oral administration.—Until recently it has not proved practicable to give penicillin by mouth as the drug is destroyed in the stomach; it has now been found that *phenoxymethylpenicillin* is more resistant to inactivation by the gastric juices and that an effective blood level can be achieved. It is prepared in two strengths: 125 mg. (the equivalent of 250,000 units of crystalline penicillin by injection) and 250 mg. (= 500,000 units). The results so far reported encourage the belief that oral phenoxymethylpenicillin bears favourable comparison with parenteral penicillin and that 125 mg. given four- or six-hourly is as satisfactory as 250 mg., especially in young people; in the elderly the larger dose is desirable. Phenoxymethylpenicillin is a welcome advance in the treatment of the disease in children.

Side-effects.—Penicillin is widely regarded as a safe drug to use. It is indeed relatively free from toxic effects but hypersensitivity to it has been reported and may become more common. It takes the form of anaphylactic shock or an allergic reaction (angioneurotic œdema) which may prove fatal. Dermatitis occurs. Treatment consists of immediate subcutaneous injection of 1 : 1000 adrenaline, 5 to 10 minims (0.3 to 0.6 ml.), or nikethamide, 1 ml. If the patient has previously had penicillin a history of sensitivity to it is important. If there is doubt a small subcutaneous injection can be given as a test-dose twenty minutes before the main dose.

THE NEWER ANTIBIOTICS IN BACTERIAL PNEUMONIA

These include *chloramphenicol*, *chlortetracycline*, *oxytetracycline* and *tetracycline*. Erythromycin will be discussed separately. These antibiotics are active against a wider range of organisms than penicillin, alone or combined with streptomycin, and are effective not only in bacterial but many non-bacterial pneumonias. Absolute indications for the use of one of the newer antibiotics are: (1) in a severe infection in which the organism is not known; (2) if treatment has to be conducted without bacteriological control and there has been no noticeable response to penicillin after two or three days; (3) if there are reasons for thinking that the pneumonia is due to a virus; and (4) if the patient is sensitive to penicillin. If the giving of injections is not possible tetracycline should be selected. It might appear unnecessary to start treatment with penicillin as tetracycline can be so easily given by mouth and has so broad a spectrum, but resistant strains can sometimes emerge so rapidly that there is much virtue in an orderly plan of treatment, beginning with the simplest preparation and proceeding as circumstances dictate to the more complex. This will ensure the maximum benefit from our therapeutic resources over the longest time.

In some infections chloramphenicol may be the only suitable drug, the organism being resistant to the tetracycline group. The response to tetracycline may be only partial, usually because more than one organism is

present, and in these cases a short course of chloramphenicol will often complete the process of resolution. For routine use, however, tetracycline is safer.

Dosage.—The standard dose is the same for all the newer antibiotics, 500 mg. initially followed by 250 mg. every four or six hours, but the dose is subject to individual variation. As with penicillin, treatment should be continued until the infection has been completely controlled, the length of time varying from patient to patient. In very ill patients the drug can be given intravenously.

Side-effects due to *chlortetracycline*, *oxytetracycline* and *tetracycline* are not common and are seldom severe: abdominal pain, nausea, vomiting and the passage of loose stools are among those usually complained of. The more rare pseudomembranous enterocolitis lies in a totally different category, the patient passing into a dangerous state of toxæmia and dehydration in a matter of a few hours. It can be traced to the disturbed balance of the intestinal flora and the organism generally responsible is a drug-resistant *Staph. aureus*. Treatment must not be delayed: intravenous fluids, erythromycin (500 mg. intravenously twice a day) and noradrenaline to raise the blood pressure are lifesaving measures. Tetracycline is reputed to be less likely to cause this complication and the risk can be reduced by the addition of vitamin B, e.g. 'becosym forte', two tablets twice daily, or preparations of the *Lactobacillus acidophilus* (e.g. 'enpac').

The use of *chloramphenicol* has been followed in some cases by aplastic anæmia or agranulocytosis. The younger the subject and the longer the course of treatment the greater becomes the risk. Blood dyscrasia is infrequent in adults if treatment is not prolonged beyond a fortnight.

Erythromycin.—This is one of the most recent of the newer antibiotics to be introduced and like them has a wide range of activity. Cross-resistance between erythromycin and penicillin or the tetracycline group does not occur and erythromycin is therefore particularly valuable in dealing with pneumonia due to resistant *Staph. aureus*. It should never be used as a routine but should be conserved for an emergency, as it may be the only available remedy for a virulent infection and sensitivity to it should not be jeopardized by indiscriminate use. If erythromycin is used indiscriminately the proportion of strains resistant to it will steadily increase and it will lose the pre-eminent position it now holds.

STAPHYLOCOCCAL PNEUMONIA AND FRIEDLÄNDER'S PNEUMONIA

I have been concerned up to the present with the antibacterial treatment of the pneumonias in general; two varieties call for specific mention:

Staphylococcal pneumonia has lately increased in importance in view of the large number of penicillin-resistant strains that are now found, particularly in hospital practice, and because the infecting organism is often highly virulent. The disease is found commonly in children and has a marked

tendency to progress to lung abscess. Spontaneous pneumothorax or pyopneumothorax may result from rupture of an abscess into the pleural cavity. The sputum should be examined and sensitivity tests carried out. These investigations should be repeated at intervals throughout treatment. Penicillin is used if the organism is susceptible, the dose being 1 mega unit twice a day. Streptomycin can be profitably combined with penicillin. The newer antibiotics are required if the organism is penicillin resistant or becomes so. 'Sigmamycin', an antibiotic mixture of oleandomycin and oxytetracycline (500 mg. initially and 250 mg. four-hourly) has been successfully employed but holds little advantage over full doses of tetracycline. A difficulty arises if the staphylococcus is resistant to all antibiotics except erythromycin. In such infections improvement will occasionally follow very large doses of penicillin (4 to 8 mega units a day) combined with postural drainage, but if this does not succeed, and the pneumonia is severe, erythromycin should not be withheld.

Friedländer's pneumonia.—The fulminating form of this pneumonia is rapidly progressive and often fatal. It is characterized by abscess formation and hæmoptysis. The upper lobes are commonly involved. Not all examples are acute but there is a marked tendency for the infection to be protracted. Erasmus (1956) has shown that the drugs to which the organism is most consistently sensitive are streptomycin, chloramphenicol and sulphadiazine in that order of frequency. A mixture of streptomycin and sulphadiazine can be used at the beginning of treatment and chloramphenicol be held in reserve should the organisms become resistant to the other two drugs. Tetracycline is sometimes effective but cannot always be relied upon.

NON-BACTERIAL PNEUMONIA

Virus pneumonia.—Pneumonia due to a virus (the 'primary atypical pneumonia' of a decade ago) is often first suspected when the illness fails to respond to treatment with penicillin or the sulphonamides. Additional evidence includes the presence of an epidemic of the disease in the neighbourhood, preponderance of constitutional over local symptoms, paucity of physical signs in the chest and the expectoration of a mucoid, rather than frankly purulent, sputum. The white cells in the blood may be normal or reduced in number; x-ray changes are in excess of what would be anticipated from physical examination. Laboratory confirmation inevitably takes time and treatment must be begun, and indeed may be concluded, before final proof is furnished. The majority of virus pneumonias respond to one of the broad-spectrum antibiotics and tetracycline is the drug of choice.

Influenzal pneumonia.—The influenza epidemic of last autumn was not itself serious; it was the secondary pyogenic invaders that were responsible for the severe complications and for most of the fatalities. The organism commonly found was a drug-resistant strain of *Staph. aureus* which, once it gained a foothold in the lungs, often led to a rapid intensification of the infection.

Treatment is a matter of urgency and the advice contained in a leading article in the *British Medical Journal* (1957) summarizes the measures to be taken. Erythromycin is the drug of choice and the dose should be of the order of 1 g. every four hours, intravenously in the first instance. The steroid hormones help to tide the patient over the critical period of 'stress': 25 mg. of hydrocortisone can be injected intravenously and repeated every six hours. Oxygen must be used liberally to counteract cyanosis. Some workers have advocated a tracheotomy on the grounds that it reduces the ventilating 'dead space' and enables the secretion in the respiratory tract to be removed more easily by suction. If this measure is decided upon it should not be postponed until the patient is *in extremis*.

Psittacosis.—This type of virus pneumonia is rare but the increasing popularity of keeping birds as pets may mean it will become more common. The diagnosis can hardly be made clinically unless it is considered as a possibility in all examples of atypical pneumonia. The answer to the question 'do you keep a bird as a pet and if so has it lately been ill?' may give a lead. Pneumonia due to psittacosis is often severe but generally susceptible to tetracycline.

Fungus infections of the lung.—Primary pneumonia due to a fungus is seldom seen in this country: the infection is more often implanted on a pre-existing condition such as an old pulmonary infarct, chronic lung abscess, a cyst or bronchiectasis, or appears in the respiratory tract after the normal flora have been eliminated by antibiotic therapy. The most powerful fungicidal agent is nystatin: 500,000 units is given by mouth every six hours. Nystatin has also been successfully employed for inhalation.

GENERAL AND ANCILLARY MEASURES IN THE TREATMENT OF PNEUMONIA

It was not long ago that the main emphasis in the treatment of pneumonia was placed on general measures and the need for good nursing; although now less important than they were they cannot altogether be ignored.

Treatment of symptoms.—In most examples of pneumonia the response to specific therapy is so rapid and complete that individual symptoms cause little trouble. There are two that may require attention: pleuritic pain and difficult expectoration.

The chest should not be firmly strapped to relieve acute pleural pain in pneumonia as this may hinder resolution and the re-expansion of the lung, but application of counter-irritants such as kaolin poultice B.P. is soothing. Painting the skin over the affected area with compound paint of iodine B.P.C. often affords relief. Pain-relieving drugs such as compound tablets of codeine B.P., one or two occasionally, or pethidine, 50 to 100 mg. by mouth or by injection, can be employed, but morphine should always be used sparingly, or not at all, in the presence of dyspnœa and cyanosis.

Difficulty in getting rid of tenacious sputum is often a cause of distressing cough and any method which will reduce the viscosity of the sputum and

promote easy expectoration should be recommended. I still feel that a potassium iodide mixture has value in spite of all that has been written to the contrary. A hot saline draught (compound mixture of sodium chloride B.P.C.) should be tried and is particularly useful on waking. Inhalation of detergent preparations such as 'alevaire' has been recommended but their place more properly lies in the treatment of bronchitis.

Sedation and rest.—Lessening of pleural pain and of ineffective coughing will go far to promote comfort and ensure sleep. Simple hypnotics of the barbiturate group are generally sufficient supplements. Complete bed rest should not be insisted upon once the acute phase is over; early mobility hastens resolution and reduces the risk of thrombosis of the calf veins. The use of a bedside commode instead of the bedpan can be allowed in all but extremely ill patients.

The care of the heart.—Cardiac failure is now a rare complication of pneumonia except in elderly patients or in those who already have heart disease. If there are any signs of its presence digitalis and the mercurial diuretics should be prescribed. A new diuretic which can be given by mouth is chlorothiazide ('saluric')—400 mg. four times a day on alternate days or twice a week is generally sufficient and can be used with reasonable safety over a short period.

Oxygen.—If the patient is cyanosed oxygen is necessary and should be given by a face-mask or by means of an oxygen tent. Narcosis due to retention of carbon dioxide is unlikely unless chronic bronchitis is present.

The corticosteroids.—The use of the steroid hormones has already been mentioned in the treatment of influenzal pneumonia which can be taken as the prototype of the sort of occasion on which they are of value. They are prescribed to tide a dangerously ill patient over a critical time of stress and need not be prolonged beyond this period. They should never be used without full and effective antibiotic or chemotherapeutic 'cover'. There is no necessity whatsoever for their use as a routine.

THE PLACE OF PHYSIOTHERAPY

It is probable that a variable degree of collapse of the affected lung takes place as a secondary result of consolidation in lobar pneumonia, due to obstruction of the bronchi or bronchioles by sticky exudate. Treatment must therefore be directed not only towards controlling the infection but equally to ensuring that the lung returns to normal. In most examples of pneumonia reinflation takes place naturally as resolution proceeds, but in some patients lobar or segmental atelectasis persists and it is in these that bronchiectasis may later be discovered. In the hands of an expert, physiotherapy is extremely valuable in bringing the lung back to normal and can be started as soon as the acute symptoms have abated and the patient is able to cooperate. Postural drainage will help to get rid of secretions and should be combined with exercises designed to increase the range of movement of the lower part of the chest and diaphragm. The patient can be trained to continue these

exercises throughout convalescence or until all signs of the disease have vanished.

THE SIGNIFICANCE OF 'UNRESOLVED' PNEUMONIA

The terms 'unresolved' or 'slowly resolving' pneumonia are misleading. Admittedly, in rare instances resolution may be incomplete and organization takes place with fibrosis, the lung becoming carnified. On most occasions, however, the clinical findings are capable of explanation on other grounds than a simple failure of resolution. The following are some of the causes:—

Pneumonia due to a drug-resistant organism has already been discussed.

Persistent atelectasis has also been mentioned (p. 691).

Pleural effusion.—It is quite common for a small effusion to form at the base of the pleural cavity during pulmonary consolidation. As a rule it is transitory, disappearing *pari passu* with resolution, but a loculated collection may persist giving rise to physical signs and x-ray changes. This should be removed.

Tuberculosis.—Acute pneumonic phthisis is now a rarity but is a potential source of difficulty in diagnosis especially if the disease has involved a lower lobe. Further investigation will quickly establish the true nature of pneumonia due to this cause.

Collagen disease.—I have lately seen one or two examples of disseminated lupus erythematosus which at onset closely resembled acute lobar pneumonia with an overlying effusion. The correct diagnosis can be reached by bearing in mind the following points: (1) The patient is generally a woman. (2) Failure to improve on antibiotic therapy, including anti-tuberculous chemotherapy. (3) Symptoms of hypersensitivity to the antibiotics used. (4) Joint pains. (5) An abnormally high erythrocyte sedimentation rate (around 100 mm. in the first hour) which persists. (6) A rise in the globulin fraction of the serum. (7) The finding of the characteristic L.E. cell in the blood, which must not be taken to exclude the diagnosis if it is absent.

Carcinoma of lung.—The most important cause of unresolved pneumonia has been left to the end. If an attack of pneumonia in a man past middle life does not clear up as expected on treatment, or if it quickly recurs in the same part of the lung, or leaves behind it a train of ill-defined symptoms, the diagnosis should be called in question. Further investigation by x-ray, examination of the sputum for neoplastic cells and bronchoscopy should follow. If this were done, not at the end of three or four months but at the end of the first month, the diagnosis of lung cancer would in many cases be made earlier than it is and the results of treatment be improved.

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THE CARE OF THE CHRONIC ASTHMATIC IN WINTER

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In treating a chronic asthmatic it is helpful to have an idea of the etiology, and, from the history, physical examination and naked-eye examination of the sputum, it is generally possible to fit the case into one of four types.

TYPES OF ASTHMA

Allergic asthma without infection.—The onset is commonly in childhood following infantile eczema and in later years rhinitis and hay fever may be associated; a family history of these is usual; the sputum is mucoid and skin tests are often positive.

Infective type.—At first the attacks are associated with respiratory infections and purulent sputum (asthmatic bronchitis), followed by free periods, but gradually these periods become shorter until the wheezing becomes persistent. There is no past history of allergic conditions nor do these occur in the family. Skin-tests are often negative.

Special mention should be made of a sub-group which I call 'middle-aged infective asthma'. These patients are usually over 35 years of age and the majority have never had much respiratory infection previously. Wheezing and purulent sputum start after a bronchial cold and persist throughout the year in spite of various treatments. Exacerbations occur but there is rarely complete freedom from wheezing, and purulent sputum and a steady downhill course are usual. The prognosis is poor in that about 40 per cent. of patients die within ten years. Such cases should be recognized early and fully investigated. Steroid therapy may be indicated.

Mixed infective and allergic type.—This mixed type probably includes over 60 per cent. of severe chronic asthmatics. Infection becomes grafted on to the allergic type or, less commonly, the patient with infective asthma becomes sensitive to dust, feathers and other allergens.

Bronchitis and emphysema type.—This group should not come under the heading of asthma at all, as the clinical picture is essentially that of recurrent bronchitis and emphysema, with an added element of periodic wheezing relieved by adrenergic drugs. Unless a careful history is taken, cases are called chronic asthmatics.

TREATMENT OF ALLERGIC FACTORS

One-third of the twenty-four hours is spent in bed and the majority of asthmatics are worse in the house. In every case therefore a real effort should be made to diminish the allergens in the bedroom; if two or more

persons share the room, precautions should apply to all beds, pillows and so on. All pillows should either be made of rubber ('Dunlopillo' or similar type) or be encased in airtight plastic pillowcases. Eiderdowns should be removed from the bedroom and the sheets and blankets should be shaken in the open every week. The mattress should be 'hoovered' weekly and, ideally, enclosed in a plastic case. Loose rugs should be removed and face-powder should be kept elsewhere. The head of the bed should be placed under the window which should be kept open top and bottom, except when weather conditions preclude this. Animal pets should never be allowed in the bedroom or indeed upstairs at all. In the living-room, cushions should be encased in plastic covers under the pretty outer cover. If the patient is known to be sensitive to domestic pets, these should be removed.

From practical experience over many years, I have no doubt that strict avoidance of allergens in the home is important.

TREATMENT OF INFECTION

The boggy swollen mucosa of the nose and bronchi in allergic subjects interferes with ciliary action and increases the tendency to infection. Avoidance of allergens is therefore helpful in diminishing the effects of infection when this occurs. Sleeping in a warm atmosphere diminishes natural resistance to infection when the patient is exposed to cold air on going to work.

From experience in the Services, boarding-schools and open-air schools, there is no doubt that an open-air hardy existence decreases the incidence of catarrhal infections and this hardening regime should be applied to young asthmatics. A cold or tepid bath in the morning is an excellent prophylactic; less effective is a cold-air bath, i.e. five minutes in the open air before breakfast, in shorts and a sweater, either skipping or running round the garden.

At the onset of a fresh infection, as recognized from previous attacks, the patient should stay in bed for forty-eight hours and gargle frequently for the first day. This 'Granny's treatment' is probably the simplest and best but is useless unless the patient goes to bed at the very beginning of the cold. If in spite of this, the infection spreads to the bronchi with a dry irritable cough and wheezing, an antibiotic should be given. Tetracycline hydrochloride seems a relatively safe drug, acting on most of the common pathogenic organisms: 500 mg. every six hours for forty-eight hours, then 250 mg. every six hours for three days, is a reasonable course for an adult; smaller doses are given for children. Extra vitamin B should be given with the antibiotic, e.g. aneurine compound tablets, strong, B.N.F., one tablet four times daily.

The sputum should be expectorated into plain water in a small glass vessel, e.g. a potted-meat jar, and the patient should record whether the sputum is purulent, muco-purulent or mucoid.

Scientific evidence of the value of stock antibacterial vaccines in respira-

tory infections is singularly lacking, yet one does see perhaps 20 per cent. of cases in which there is a good effect. In selected cases I use a stock vaccine containing *H. influenzæ* (e.g. Parke Davis & Co.'s anti-influenza vaccine [mixed]) in small dosage: e.g. 0.1, 0.2, and 0.3 ml. at weekly intervals, and then 0.4 ml. at monthly intervals. If there is a good response, this small dosage should be continued throughout the year.

For the chronic bronchitic with added asthma, climate has more effect than any other treatment. Whilst the wealthy can travel abroad, a good deal can be done for the poor man by urging him on medical grounds to find a job on the south coast; the practitioner should use his authority as medical adviser to persuade the patient to take this step—too often the advice is given half-heartedly.

PALLIATIVE TREATMENT

The modern physiotherapist is a highly skilled person and can do much for many asthmatics by teaching the patient to use the respiratory muscles to better advantage, to relax mentally and physically, and to have confidence in what he can do for himself during an attack. The patient requires someone who has time to teach the technique of correct breathing and the physiotherapist does in fact give confidence and psychological help to the patient quite apart from routine exercises. In my opinion an asthmatic has not been fully treated without physiotherapy.

TREATMENT OF THE 'HARDENED' CASE

If the foregoing lines of treatment are thoroughly carried out, some 60 per cent. of chronic asthmatics are materially improved, and the earlier treatment is started the better the results.

The remaining 40 per cent. form the hard core for treatment. Some have become inhaler addicts, using their inhalers up to 50 times per day. The nebulizer giving a spray of adrenaline and other drugs is an excellent palliative but should be used sparingly or it may lose its effect and may actually increase the bronchospasm if used to excess—as I have proved on many occasions by admitting the patient to hospital so as to wean him from his inhaler.

Combinations of ephedrine and a theophyllinate with a barbiturate (e.g. 'amesec', 'franol', or 'tedral' tablets) seem to act better than when these drugs are given separately, and may be used three or four times per day. Choline theophyllinate ('choledyl') tablets, 200 mg., seem to cause less gastric irritation than aminophylline. Linctus of codeine B.P.C., 60 minims (4 ml.) night and morning, is often useful. Most patients have their own favourites but I would again stress the importance of using palliative drugs sparingly and not as the primary treatment.

STEROID TREATMENT

Corticotrophin and cortisone or its derivatives have a profound effect on the allergic conditions, particularly asthma and eczema. Theoretically,

corticotrophin, which stimulates the patient's adrenal glands, should be used rather than cortisone or its derivatives, which tend to cause atrophy of the adrenals. Corticotrophin, however, requires to be given by injection, the strength varies in different makes, and even batches, and, as it is obtained from the ox or the pig, allergic reactions sometimes occur. I have therefore used cortisone and, more recently, prednisone or prednisolone. New synthetic drugs giving fewer side-effects are being produced.

It is reasonable to use the steroids as a temporary treatment over a few days in status asthmaticus, or sharp exacerbations of asthma with respiratory infections but otherwise we should remember that these are potent drugs with serious side-effects and should not be prescribed lightly, or until other and simpler treatments have been given a thorough trial. In my own practice I rarely prescribe the steroids unless the patient has been in hospital under observation for two to three weeks. A radiograph of the chest to exclude tuberculosis is an essential investigation.

Side-effects.—The side-effects of cortisone or prednisone may be divided into early and late. Early ill-effects include sodium retention and hypertension (with cortisone particularly), and relapse of peptic ulcer with hæmorrhage or perforation; symptoms of the latter may be masked by the drug, so that peritonitis may give little pain or rigidity. A latent or active tuberculous lesion may flare up and the same applies to psychotic conditions. Moon face, hirsuties and a buffalo hump are minor disadvantages. Late effects include partial atrophy of the adrenal glands, with poor response to trauma or infection, and occasionally sudden death. Decalcification of bone with compression fracture of the vertebræ occurs. Perhaps the most troublesome ill-effect is that once the patient has become used to the drug it is difficult, if not impossible, to withdraw it as the asthma may recur even worse than before.

It should be noted that when a patient who has been on a regular dose of steroids develops an acute illness, such as infection or trauma, or requires an operation, the dose of steroids should be increased by 30 to 50 per cent. and on no account should the drug be withdrawn suddenly because of the relative atrophy of the adrenal cortex.

INDICATIONS FOR STEROID TREATMENT

Status asthmaticus (defined as severe asthma with orthopnœa not relieved by adrenaline or intravenous aminophylline).—If possible the patient should be admitted to hospital forthwith as the mortality is considerable. Infection is usually present and therefore penicillin, 1 mega unit, should be given twice daily. Aminophylline should be given intravenously, 500 mg. in 20 ml., preferably by an intravenous drip, so that further doses of 250 mg. can be given if required.

If the patient is able to swallow, prednisone tablets, 5 mg., should be given—two tablets every hour for three doses, then one tablet every four hours to a total dosage of 60 mg. in twenty-four hours. If the patient is

unable to swallow, cortisone hemisuccinate sodium (Glaxo), 100 mg., should be given intravenously and repeated in twelve hours if required. In two or three days, when the patient has recovered from 'status', the prednisone should be withdrawn slowly, over fourteen to twenty-one days: from 60 mg. daily to 50 mg. for two days, then 40 mg. for two days, then 30 mg. for two days, then reduce by 5 mg. daily until 15 mg. is reached. Then reduce by 2.5 mg. daily to 7.5 mg., after which by 2.5 mg. every fourth day until the drug is stopped.

Acute exacerbation of asthma with infection.—Give tetracycline hydrochloride, 500 mg. every 6 hours for three days, then 250 mg. every 6 hours for two days. With this give aneurine compound tablets, strong, B.N.F., 1 four times daily. In addition, prednisone should be prescribed, 10 mg. four times daily for two days, then reduce by 5 mg. daily to 15 mg. and then by 2.5 mg. every fourth day until the drug is withdrawn.

INDICATIONS FOR LONG-TERM USE OF STEROIDS

Middle-aged infective asthma.—This type has already been described and is fairly easily recognized clinically. Accepting that local allergens have been removed, that the patient has had physiotherapy and the usual palliatives without marked benefit, I would start prednisone in high dosage (e.g. 40 mg. daily until wheezing and sputum have ceased for a week). If this does not occur the dose should be increased to 60 mg. daily; if this dose does not abolish symptoms the patient is not likely to respond. Once the symptoms have been abolished the dosage of prednisone should be reduced by 5 mg. every second day to 20 mg. Then by 2.5 mg. every fourth day to 15 mg. which should be continued for two weeks. If still free of wheezing and sputum, dosage should be reduced cautiously to the lowest dose which keeps the patient relatively free—usually 12.5 to 7.5 mg. daily. With a fresh respiratory infection or relapse, the dose should be increased to 20 mg. daily for two to three days and then slowly reduced to the maintenance dose again.

The patient should be warned of the side-effects, especially peptic symptoms, and should take snacks between meals, with a milk drink and 'aludrox', two teaspoonfuls, at bedtime.

Severe eczema and asthma in adolescents over 16 years of age.—It is probably reasonable to prescribe prednisone in the same way for this small group. It is worth while trying to desensitize the patient to the strongest allergen as shown by skin tests, e.g. fish, egg or milk, under cover of prednisone, and then to withdraw the drug.

Children with severe eczema-asthma syndrome.—These children often respond dramatically to prednisone but I feel that as we yet know so little of the effects of steroid treatment in later years, the drug should only be prescribed by pædiatricians as a research project.

THE USE OF AEROSOLS IN RESPIRATORY DISEASE

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The introduction of therapeutic agents into the respiratory tract by inhalation is by no means a recent development in medical practice. Steam kettles and tents have been in use for centuries in the treatment of acute bronchitis and broncho-pneumonia, and this measure is still regarded as a valuable means of liquefying tenacious secretion, particularly in children. Before the introduction of antibiotics creosote was widely employed in cases of advanced bronchiectasis to reduce fœtor and to act as a non-specific bronchial 'disinfectant'. A series of sessions in the creosote chamber was, however, a rigorous form of treatment and in those patients who claimed benefit the effect was probably due to the emptying of bronchiectatic cavities by the violent paroxysms of coughing it induced rather than to the supposed cleansing properties of the creosote.

The present vogue for inhalation therapy, however, is little more than ten years old and dates from the time when suitable nebulizers became generally available. An 'aerosol', which is the term now applied to the mist emitted by a nebulizer, is a suspension of fine droplets in a gas such as air or oxygen. The term is sometimes applied also to a suspension of finely divided solid particles. The object of aerosol inhalation is to deposit therapeutic agents on the bronchial mucosa and for this to be achieved the size of the particles is obviously of some importance. Estimates of the ideal particle diameter vary considerably, ranging from 1 to 20 microns. It is generally agreed, however, that droplets larger than 20 microns are liable to lodge in the pharynx and larynx whilst those smaller than 1 micron may be discharged in the expired air without coming into effective contact with bronchial mucosa.

TYPES OF NEBULIZER

There is a wide choice of nebulizers on the market, most of which are reasonably efficient and capable of producing a particle size within the therapeutic range. Broadly speaking there are two types of apparatus: nebulizers driven by compressed air or oxygen, and hand-operated models. The first type is undoubtedly the more efficient in that it can achieve a smaller and more uniform particle size, which is particularly important with detergent aerosols. The apparatus, which requires an air compressor or an oxygen cylinder, is very cumbersome, however, and is suitable only for hospital use. Hand-operated nebulizers driven by the compression of a

rubber bulb are less efficient, but have the advantage of being readily portable. In selecting such a nebulizer care must be taken that the bulb is of a suitable size and shape to be grasped comfortably by the hand. Some manufacturers produce models apparently designed more for easy conceal-

FIG. 1.—The 'medihaler' nebulizer.

ment in the pocket or handbag than for functional efficiency. Every patient given a nebulizer should be fully instructed in its use. Vigorous and rhythmical compression of the bulb coinciding with deep inspiration is essential for successful results.

A new type of nebulizer has recently been introduced (fig. 1) in which the solution to be inhaled is provided by the makers, in a reinforced glass bottle which also contains an inert gas under pressure. When the bottle is fitted to the mouthpiece, pressure upon it opens a valve and allows the escape of an aerosol of a consistently uniform particle size. This type of apparatus combines efficiency and unobtrusiveness, and has been specially designed for the administration of spasmolytic aerosols. It is of particular value in children with asthma who often experience difficulty in operating the conventional type of nebulizer. It has the disadvantage, however, of being very expensive, each 10-ml. refill bottle of adrenaline or isoprenaline costing about five times as much as the same amount dispensed in an ordinary bottle.

With every type of nebulizer the inhalations must always be made through the mouth. The nasal adaptors sometimes provided are of no value.

INDICATIONS FOR AEROSOL TREATMENT

The inhalation of aerosols has been recommended for three purposes:—

(1) The administration of spasmolytic drugs for the relief of bronchospasm.

(2) The administration of agents believed to have the property of liquefying tenacious mucus.

(3) The administration of antibiotics in the treatment of respiratory infection.

SPASMOLYTIC DRUGS

Probably the most useful application of aerosol therapy is in this field. The inhalation of a 1 per cent. aqueous solution of either adrenaline or isoprenaline will provide temporary relief of bronchospasm in a high proportion of cases. In general, the two drugs are almost equally effective but individual differences are common and can only be discovered by trial of each drug in turn. The most economical preparation of a 1 per cent. solution of isoprenaline suitable for nebulization is spray of isoprenaline sulphate B.P.C. Unfortunately, there is no corresponding official preparation of 1 per cent. adrenaline, but this can be prescribed by substituting adrenaline hydrochloride for isoprenaline sulphate in the formula for spray of isoprenaline sulphate B.P.C. The prescription:—

Adrenaline hydrochloride	0.5 g.
Propylene glycol	2.5 ml.
Sodium metabisulphite	0.05 g.
Distilled water	to 50 ml.

must be written in full, which is a slightly tedious procedure, and it is to be hoped that the omission will be rectified in the next edition of the *British National Formulary*.

In many proprietary solutions, adrenaline or isoprenaline is combined with small doses of other drugs, such as atropine, papaverine, pituitary extract and extract of suprarenal medulla. There is no proof that the addition of these substances augments or potentiates the action of the main therapeutic agents, nor indeed is there any pharmacological basis for expecting such an effect. These proprietary preparations, however, are widely prescribed and as they cost between three and six times as much as the N.F. solution their use must add considerably to the national drug bill. It is interesting to speculate on the reasons for the popularity of these commercial products. High-pressure advertising has undoubtedly much to do with the family doctor's original choice of a proprietary solution, and the asthmatic patient, being notoriously suggestible, is always reluctant to change to another preparation if the original one has proved satisfactory. In consequence many doctors, although fully appreciating the need for economy in prescribing, are unwilling to risk a deterioration in their patients' condition by insisting on the use of non-proprietary preparations. These difficulties could be largely avoided if standard solutions were used consistently from the start of treatment. Even if he believes that the additional constituents of the proprietary solutions have any special merit the practitioner can prescribe compound spray of adrenaline and atropine B.P.C. (0.5 per cent. adrenaline) or compound spray of isoprenaline sulphate B.P.C. (1 per cent. isoprenaline), which differ in no essential respect from most of the commercial products and are much cheaper. The B.P.C. preparations contain papaverine and atropine methonitrate in addition to adrenaline or isoprenaline.

An aerosol of hydrocortisone hemisuccinate inhaled in a dose of 5 mg.

thrice daily has been found to be completely ineffective in relieving bronchospasm in chronic asthmatics (Brockbank, Brebner and Pengelly, 1956). When hydrocortisone acetate, 3 mg. daily, was inhaled as a dry powder, however, a marked improvement was recorded in over half the cases. When prednisolone was used in the same manner no effect on the bronchospasm was observed (Brockbank and Pengelly, 1958). The trials with these three preparations were carefully controlled and the results suggest that the inhalation of powdered hydrocortisone might with benefit be used on a larger scale. Although some of the inhaled hydrocortisone may be absorbed systemically the daily dose (3 mg.) is so small that it is unlikely to cause serious side-effects, even with prolonged administration.

Method of administration.—A nebulizer for the administration of spasmolytic drugs to ambulant patients with asthma must be of the hand-operated type. Although less efficient than those driven by compressed air or oxygen most hand-operated nebulizers can generate a satisfactory aerosol for short periods and are therefore perfectly adequate for the treatment of bronchospasm, in which prolonged administration is not required and particle size is apparently not of critical importance. The maximum effect is generally obtained from the inhalation of 0.5 to 1 ml. of solution over the course of 30 to 60 seconds. There is some individual variation but patients soon discover their own optimum dose. The inhalation is generally effective within two minutes and there seems no doubt that the drug acts locally on the bronchi. If too large a dose is taken, however, side-effects, such as pallor, tremor, palpitation and tachycardia, may result from absorption of the drug into the circulation. There is no evidence that the habitual use of a nebulizer has any harmful effect on the bronchial mucosa, nor that prolonged treatment results in a reduced response to spasmolytic drugs. Indeed, to many asthmatic patients the nebulizer seems quite indispensable. Although in the main the relief afforded by it has a true pharmacological basis, the nebulizer has perhaps psychological value also, as a symbol of security in a life constantly under the threat of sudden and disabling respiratory distress.

THE LIQUEFACTION OF BRONCHIAL SECRETIONS

In many diseases such as laryngo-tracheo-bronchitis, bronchial asthma, whooping-cough, chronic bronchitis, capillary bronchitis and neonatal and postoperative atelectasis, viscid mucus in the air passages often causes respiratory distress or bronchial obstruction, and for many years pharmacologists have been seeking an agent with the power to liquefy mucus and render it easier to expectorate. This property is possessed to a limited extent by steam and also by water inhaled as a very fine aerosol. These agents, which act by promoting hydration of the sputum, are of some therapeutic value but are clearly inadequate in many cases. Efforts to find something better were first concentrated on the *proteolytic enzymes* such as streptokinase, deoxyribonuclease and trypsin but the results with all three

proved disappointing. The basic reason for this is that mucoid sputum, which is more liable than purulent sputum to become excessively viscid, does not contain a high proportion of the proteins on which these enzymes act—fibrin in the case of streptokinase and trypsin, and deoxyribonucleoprotein derived from degenerating polymorphs in the case of deoxyribonuclease. Nevertheless some authors (Limber, Reisser and Roettig, 1952; Unger and Unger, 1953; Habeeb *et al.*, 1954) have claimed good results from inhalations of trypsin aerosol. This enzyme, however, is a fairly strong irritant and many patients develop conjunctival inflammation, transient hoarseness and vigorous cough after treatment. It is possible (Farber *et al.*, 1954) that any beneficial effect the enzyme has is solely by virtue of its action as a respiratory-tract irritant. The general consensus of opinion among physicians is that the inhalation of proteolytic enzymes is of no practical value and their use is not recommended.

In 1954, superinone, a *detergent* suitable for aerosol inhalation, was developed, which it was hoped would reduce the viscosity of sputum by lowering surface tension. This detergent is now marketed commercially as 'alevaire', which consists of 0.125 per cent. superinone in a sterile aqueous solution containing also 2 per cent. sodium bicarbonate, with 5 per cent. glycerin added to stabilize the aerosol droplets. As the aerosol must be of very small particle size (0.5 to 3 microns), the nebulizer must be driven by compressed air or oxygen. 'Oxygenaire' and 'Bright' nebulizers are suitable for this purpose. The aerosol is most conveniently administered by a face-mask connected to the outlet of the nebulizer by wide flexible tubing. Treatment can be given either intermittently for half to one hour, two to four times daily, or continuously for twenty-four to forty-eight hours in seriously ill cases.

Although clinicians were at first enthusiastic about the results of aerosol detergents, particularly in neonatal atelectasis and acute bronchiolitis in children, there has recently been a growing suspicion that the beneficial effects were due mainly, if not entirely, to the hydrating, as distinct from the detergent, action of the aerosol.

This view received objective support in a recent controlled trial (Palmer, 1957) in which it was shown that 'alevaire' and a solution containing sodium bicarbonate and glycerin, but no detergent, were equally effective in lowering the viscosity of mucoid sputum and in facilitating its expectoration. It was further shown that the sodium bicarbonate in the control solution was not responsible for the symptomatic improvement which was apparently due solely to the hydration of the viscid sputum by the water in the aerosol.

If these results are confirmed it will have to be assumed that the best means at present available for the liquefaction of sputum is the inhalation of an aerosol composed of water alone. For this to be effective, however, an efficient nebulizer must be used.

The development of more effective synthetic detergents is, of course, continuing and this project is perhaps more likely to meet with success than the search for new proteolytic enzymes.

ANTIBIOTICS

Any antibiotic which dissolves in water to produce a solution of suitable pH can be safely administered by aerosol inhalation. The two most commonly used are benzylpenicillin, in a concentration of 300,000 units per ml., and streptomycin sulphate, in a concentration of 0.2 g. per ml. The two antibiotics can be given either singly or in combination in 5 ml. of solution thrice daily, using a nebulizer driven by compressed air or oxygen.

The results obtained from the administration of antibiotics by aerosol inhalation have been extremely disappointing and this form of treatment has been largely abandoned. It has failed for two reasons. In the first place, the aerosol tends to cause bronchial irritation and bronchospasm, especially in patients with chronic bronchitis—the condition in which local antibiotic therapy might have been expected to yield its best results. Secondly, an antibiotic applied to a mucosal surface covered with mucus and catarrhal exudate cannot reach the more deeply situated inflammatory process in the bronchi or adjacent pulmonary tissue in a sufficient concentration to control the infection. To achieve that purpose the systemic administration of an antibiotic in high dosage is required. Any benefit which antibiotic aerosols may provide in respiratory infections is probably derived from the systemic effect of the small fraction of the dose which is absorbed from the respiratory tract.

CONCLUSIONS

The inhalation of aerosols containing adrenaline and isoprenaline is of considerable value in the symptomatic treatment of bronchial asthma. Inhalation of hydrocortisone acetate as a dry powder may also be effective and warrants further study.

An aerosol of small particle size composed solely of water is probably the best means at present available for liquefying viscid bronchial mucus. The earlier claims made for proteolytic enzymes and detergents have not been substantiated.

Aerosol inhalation has not proved a satisfactory technique for the administration of antibiotics even when infection is apparently localized to the bronchial mucosa.

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THE PREVENTION AND CARE OF RESPIRATORY INFECTIONS IN THE NEWBORN

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THE establishment of normal respiratory function in the new-born infant involves a remarkable series of anatomical and physiological changes. It is not surprising that failure to effect these adequately is a common occurrence, and that 'anatomical' and 'physiological' disorders of respiration, resulting in greater or lesser degrees of asphyxia, constitute an important factor in neonatal morbidity. Another important factor is infection. In the immediate neonatal period—the first few hours or days of life—asphyxia and infection are often closely intermixed and the relative extent to which asphyxia on the one hand and infection on the other contribute to an infant's illness may be difficult or impossible to determine. Later in the neonatal period infection of the respiratory system tends to take on a 'purer' form unrelated to birth asphyxia.

Thus, in the neonatal period—defined as the first month of life—we can conveniently divide respiratory infection into two chronological groups: early neonatal closely related to delivery and seen usually within the first week of life, and late neonatal, occurring later in the neonatal period and seen usually after the first week of life.

PREVENTION OF EARLY NEONATAL RESPIRATORY INFECTION

Early neonatal respiratory infection is usually prenatally acquired. The common prenatal route is via the liquor as a result of premature rupture of the membranes. It can probably be acquired natally during prolonged difficult labour, especially when manipulation and instrumentation are required. Bound *et al.* (1956), however, found little evidence of this in their review of perinatal mortality. It can doubtless be acquired postnatally, often superimposed on other pathological disorders such as pulmonary atelectasis, pulmonary hyaline membrane and disordered respiratory function consequent on cerebral birth injury.

The prevention of early neonatal pneumonia thus lies primarily in the province of the obstetrician. Obstetrical management designed to reduce the incidence of premature rupture of the membranes and to avoid unduly prolonged labour will contribute to the reduction of respiratory infection of the fœtus. The premature infant is much more prone to pulmonary hyaline membrane and atelectasis; his resistance to infection is considerably less

than that of his full-term brother. Factors which reduce the incidence of prematurity, such as improved standards of living, better nutritional care and increasing obstetric knowledge, are also therefore likely to reduce the incidence of early neonatal infection.

Prophylactic chemotherapy.—As early neonatal respiratory infection is usually acquired prenatally can anything be done to prevent it at the fœtal stage? Is there any place for antibiotics administered prophylactically to the mother? Penicillin, streptomycin, chloramphenicol, the tetracyclines and erythromycin all cross the placenta and appear in cord blood in concentrations of one-fifth to one-half that in the maternal blood. Only penicillin occurs in the liquor in adequate concentration (Charles, 1954). In prescribing antibiotics it has to be remembered that the predominant organism in fœtal infection is *Escherichia coli*. It has been suggested that when labour is prolonged high vaginal swabs from the mother should be plated within twenty-four hours of the rupture of the membranes to identify the probable infecting organism and to assess its drug sensitivity (Charles, 1954). In a series of 400 high vaginal swabs in puerperal pyrexia, Bowie (1954) found that *E. coli* was isolated in 43 per cent. and enterococci in 27 per cent. These organisms were most sensitive to chloramphenicol, the tetracyclines, streptomycin, sulphonamides and penicillin in that order.

In a controlled trial McCredie Smith *et al.* (1956) found that combined oxytetracycline (500 mg. orally every six hours) and streptomycin (1 g. intramuscularly twice daily) given to the mother prophylactically were of definite value in preventing fœtal infection. Their criteria for the diagnosis of fœtal infection were maternal pyrexia (98.6°F. [37°C.] or over) and fœtal tachycardia (a rate of 160 or more per minute sustained for at least ten minutes). The reduction in mortality was seen only when it had been possible to administer the antibiotics for forty-eight hours or more before delivery.

Another way of using antibiotics prophylactically is to start administration at birth to infants of mothers whose membranes have ruptured early in labour. The difficulty of diagnosing early neonatal pneumonia and the high death rate from it may well justify this practice. For some, however, fear of encouraging antibiotic resistance will be a restraining factor. Penicillin and streptomycin are probably a suitable combination, in a dosage of 100,000 units of penicillin and 0.1 g. of streptomycin every six hours.

THE PREVENTION OF LATE NEONATAL RESPIRATORY INFECTION

There can obviously be no hard and fast dividing line between early and late neonatal respiratory infection. Before and after the end of the first week, however, different groups of factors are likely to be implicated in the etiology. In late neonatal respiratory infection the infant's environment, whether in hospital or home, is of prime significance. The nature of the delivery is less likely to be of major importance. Prematurity and certain

congenital anomalies, such as fibrocystic disease of the pancreas, can play a significant role in certain cases.

CONTROL OF THE HOSPITAL ENVIRONMENT

Whilst advances in hospital obstetric practice have in recent years conferred enormous advantages on mother and infant it has become increasingly recognized that the hospital environment encourages the development of certain organisms, particularly virulent antibiotic-resistant staphylococci. Outbreaks of staphylococcal pneumonia in new-born infants have been reported from maternity units in this country and abroad. Control of neonatal staphylococcal infection has not proved easy. To the problems of unsatisfactory hospital buildings, overcrowded accommodation, limited nursing staff and restricted finance no immediate solution appears likely. Much, however, can be done in routine day-to-day management to reduce the danger.

There are three important means by which cross-infection occurs in maternity units: dust, contact and droplet infection. Of these, dust is probably the most important.

Dust-borne infection.—In the hospital atmosphere dust particles can carry pathogenic organisms, particularly staphylococci. From the work of Wallace and Duguid (1952) it can be calculated that in a hospital nursery one dust particle carrying pathogenic staphylococci can land on each square inch of floor surface every twenty-four hours. The problem of staphylococcus-carrying dust particles can be approached from two angles: from that of reducing dust and from that of attempting to eliminate possible sources of staphylococci from which the dust is contaminated. The concentration of dust in the atmosphere depends upon many factors. Important among these are the dislodgement of dust from personal clothing and from bedclothes on bed-making, ward-dusting and excessive movement of personnel. Woollen blankets create a particular problem. As they do not stand boiling they are usually washed at a temperature of 90°F. (32.2°C.) which does not, of course, kill staphylococci. Blankets returned from laundering in this way are usually heavily contaminated with staphylococci. The sources of staphylococci are open staphylococcal lesions, the nasopharynx and umbilicus of the new-born infant, which rapidly become colonized, and carriers among the staff.

In the control of dust-borne staphylococcal infection certain simple measures can be instituted each of which contributes something to the solution of this problem; wet mopping and the use of vacuum cleaners for dusting; the use of cotton or turkish towelling blankets so that all bedclothes can be boiled during laundering; the avoidance of unnecessary movement of personnel; the avoidance of overcrowding. The treatment of the persistent nasal carrier among staff is more controversial. Gould and Allan (1954) have reported good results with the use of an antibiotic cream applied to the nares. Staff with active staphylococcal infection should be

excluded. In the context of hospital architecture suitable ventilation systems can make a contribution.

Infection by contact.—The second means of cross-infection is contact. In this, hands and fomites play an important part. Adequate hand-washing between the handling of infants is important, and the use on the hands of creams incorporating antiseptics such as chlorhexidine ('hibitane') has been found valuable. Towels, baths and changing-tables are often heavily contaminated with staphylococci. The careful washing of baths between the bathing of individual infants and the reduction of bathing to a minimum, the avoidance of common changing-tables by 'cot nursing', the use of paper towels or the frequent sterilization of towels will help to reduce contact infection.

Droplet infection.—The third means of cross-infection, so far as staphylococci are concerned, is probably the least important. Few staphylococci are disseminated directly from mouth and nose to infant by droplets. The wearing of masks has been shown to contribute little to the prevention of neonatal staphylococcal infection (Forfar and Maccabe, 1958). Indirectly, staphylococcal droplet contamination of a persistent nasal carrier's clothing is likely to be important in respect of contamination of the dust which will be liberated from the clothing on movement. Droplet infection may play an important part in other forms of respiratory infection such as infection due to viruses. In the prevention of such, for example coryza, the wearing of a mask may be important.

Predisposing minor infections.—A matter of some controversy in the prevention of staphylococcal respiratory infection is the extent to which minor staphylococcal infection in the new-born infant predisposes to more severe infections. Ideally, minor staphylococcal infection should be prevented altogether but this is seldom possible. Some believe that minor staphylococcal infections, such as conjunctivitis, skin pustules and paronychia, should be treated locally without antibiotics, others that when such infections persist for three or four days antibiotics should be administered in adequate dosage for short periods. The abstinence of the first group is dictated by the fear of drug resistance, the indulgence of the second by the conviction that minor staphylococcal infection is potentially dangerous and justifies the early treatment of minor lesions with the object of preventing more serious (e.g. respiratory) complications. The advocates of the latter policy believe that the many short courses of treatment they give incur no greater risk of the development of antibiotic resistance than the few prolonged courses necessary in deep-seated major infection. In minor staphylococcal infection with the hospital staphylococcus, erythromycin (5 mg./lb. body weight [11 mg./kg.] six-hourly for four days) is a suitable antibiotic, being effective by mouth, and unlikely to upset the bacterial flora of the gut (Forfar *et al.*, 1955). For the initial treatment of minor staphylococcal infection 1 per cent. aqueous gentian violet can be used on skin lesions and 0.25 per cent. chloramphenicol solution in conjunctivitis.

It is often forgotten that the infant born in hospital may carry the hospital environment home with him. He will frequently return home with nose and umbilicus colonized by drug-resistant hospital staphylococci and he may continue to carry these for several weeks. Thus any staphylococcal *infection developing within a few weeks of return home* may well be antibiotic resistant and quite unresponsive to treatment with penicillin.

CONTROL OF MATERNALLY DERIVED INFECTION

Although the mother in hospital has been largely exonerated as a source of staphylococcal infection of her infant she may be the source of other infections.

The new-born infant is peculiarly liable to *tuberculous infection* of the lung. Contact of the unprotected infant with active tuberculosis must be avoided. Current practice is to separate the infant at birth from an actively infected mother and not to allow further contact, at least until the infant has been successfully vaccinated with BCG. By this time, too, the mother's infection may well have been brought under some degree of control.

Thrush is a common infection of the new-born infant's mouth. With improved hospital hygiene epidemic thrush is largely a thing of the past. Sporadic thrush in infancy is usually derived from mothers, 10 per cent. of whom carry thrush in the vagina during the puerperium. Very rarely, thrush involves the respiratory system, particularly in infants who have been treated with antibiotics. Prophylaxis consists of early recognition and treatment of oral thrush and awareness of the risk of involvement of the lungs during antibiotic therapy. The standard treatment of oral thrush is the application after each feed of 1 per cent. aqueous gentian violet.

CONTROL OF HOME ENVIRONMENT

The home may contain many sources of infection for the new-born infant. The incidence of neonatal staphylococcal infection in babies born at home is not very different from that in hospital (Spence *et al.*, 1954). The main difference is that the staphylococcus encountered, unlike the hospital staphylococcus, is usually sensitive to penicillin. The risk of staphylococcal infection occurs particularly in homes where one or more members of the family suffer from, or are subject to, recurrent staphylococcal infection—the entrenched family staphylococcal infection described by Spence *et al.* Treatment of affected members may reduce the risk to the baby.

In the home there are other particular risks as regards respiratory cross-infection. The frequent presence there of young children may bring the new-born infant into contact with childhood infections. Fortunately he usually has some immunity to the infectious fevers such as measles and diphtheria. Whooping-cough can occur and can be a serious illness with a high incidence of complicating broncho-pneumonia. Up to the age of 15 years about 3 per cent. of cases of whooping-cough occur in the first month of life (Spence *et al.*, 1954). Mild upper respiratory-tract infection in adults

and children, which is presumably of virus origin, may also be infectious to the new-born infant. The infant's illness may be mild, as in the contact, but it may be very much more severe and result in severe bronchiolitis or pneumonia. So far as is possible therefore exposure of the new-born infant to infected adults or older children should be avoided.

Two social factors have been shown to influence the incidence and severity of respiratory infection in infancy: the standard of maternal care is related inversely, overcrowding directly (Spence *et al.*, 1954).

THE CARE OF EARLY NEONATAL RESPIRATORY INFECTION

Only in the past few years has it come to be recognized that ante-partum and early post-partum pneumonia is a common occurrence. The report of the Scottish Sub-Committee on Neonatal Deaths Due to Infection (Department of Health for Scotland, 1947) focused attention on this. It showed the wide dissociation which exists in the immediate post-partum period between the incidences of respiratory infection based on clinical and on pathological diagnosis.

Only when routine post-mortem examination of all stillbirths and neonatal deaths is carried out is it possible to assess incidence accurately, based upon the presence of polymorphous exudate in the alveoli. Clinical signs of pneumonia in this period are too unreliable. In a recent pathological review of perinatal deaths Bain (1957) showed that out of 509 deaths between the 2nd to the 28th day of life infection accounted for 90, 59 of which occurred between the 2nd and 7th days; 53 of the 59 were due to pneumonia. Between the 7th and 28th days there were 31 deaths from infection—18 from infection of the respiratory system. Thus, 14 per cent. of all neonatal deaths were due to respiratory infection (10.5 per cent. 'early' and 3.5 per cent. 'late').

The *diagnosis* of early neonatal respiratory infection can seldom be made with confidence. It is usually suspected rather than firmly established. What should arouse suspicion? The circumstances of the infant's birth will be important. Did the mother suffer any febrile illness late in her pregnancy and was there fœtal tachycardia? Was there delay between the rupture of the membranes and the delivery of the child? (in nearly 8 per cent. of deliveries there is a delay of over 40 hours between rupture of the membranes and delivery [Bainbridge *et al.*, 1958]). Was the liquor offensive? Has the infant shown evidence of asphyxia? Affirmative answers to these questions increase the likelihood that respiratory infection is present. Signs in the infant tend to be peculiarly indefinite. He is usually apathetic and inactive and feeds poorly. Signs in the chest may be absent. There may be the increased and more rapid respiratory movement, the intercostal and costal margin recession and the acute emphysema which are usually associated with pulmonary hyaline membrane, or the slow irregular spasmodic respiration associated with cerebral birth injury. Hyaline membrane, atelectasis, interstitial emphysema and birth injury may be concomitants of respiratory infection.

Auscultation will probably be negative or reveal a few scattered crepitations. Some degree of cyanosis may be present. The temperature will probably not be raised. The white-cell count is unlikely to be of much help. Radiological examination may show areas of diminished radiotranslucency indistinguishable from those seen in atelectasis. Many infants suffering from early neonatal respiratory infection die without the presence of an infective process being recognized and without anti-infective treatment being instituted.

Specific treatment.—In so far as asphyxia is present certain forms of treatment should receive attention. Secretions in the mouth or nasopharynx should be removed using a mucus extractor; the environmental temperature should be adjusted according to the weight of the infant; tight or excessive clothing should be avoided. The premature infant is probably best nursed naked when there are facilities for this. A dry atmosphere should be avoided. Humidification of the atmosphere can be achieved in hospital using special apparatus. Simple equipment such as a steam kettle or towels dipping into a basin of water and hanging in front of a fire or heater may also achieve this, to some extent at least. Convincing confirmatory evidence of the value of aerosol sprays such as 'alevaire' is lacking. The use of oxygen administered in an incubator or oxygen box is indicated when the infant is cyanosed or shows respiratory embarrassment. To avoid the risk of retrolental fibroplasia, particularly in the premature infant, the concentration should not exceed 40 per cent. Lacking better facilities other means of oxygen administration may be employed, such as a funnel over the face or an open canopy round the head into which oxygen is fed. With these the concentration of oxygen is not likely to exceed 40 per cent. The rate of flow should not be high, however—one litre per minute is adequate.

If the appetite is poor and vomiting present it is wise to give fluids in the form of 10 per cent. glucose solution for a day or two to avoid the risk of further respiratory embarrassment and infection by the aspiration of vomitus.

When recognizable evidence of asphyxia is absent and the respiratory infection is 'silent' in character these measures may not be indicated. In all cases, however, active antibiotic treatment will be necessary. The indications will be circumstantial evidence attending the delivery and informed clinical suspicion. Antibiotic therapy depends upon the organism likely to be responsible. Penicillin alone is unlikely to be effective. Penicillin with streptomycin (crystalline penicillin, 100,000 units intramuscularly, and streptomycin, 0.1 g. intramuscularly, every six hours) or chloramphenicol alone (50 mg./lb./day [110 mg./kg.] in divided doses given four-hourly) may be used.

THE CARE OF LATE NEONATAL RESPIRATORY INFECTION

A number of infecting agents may be responsible for respiratory infection occurring after the first week of life. Chief among these is undoubtedly the

staphylococcus, although coliform organisms, other bacteria, viruses and fungi may also be implicated.

Staphylococcal pneumonia.—The occurrence of a severe respiratory illness in the new-born infant after the first week of life raises the possibility of staphylococcal pneumonia. Unlike prenatally acquired respiratory infection staphylococcal pneumonia is usually accompanied by distinct clinical signs. The infant may have appeared unwell for a day or two and may have had a nasal discharge. He appears toxic with a greyish cyanosis. Failure to feed and irritability are common. The respiration rate is increased. Costal margin and intercostal recession will usually be present. The percussion note is often impaired. Cough may be present. Air entry is often reduced and coarse crepitations are often present. The temperature and the white-cell count are usually raised. Radiographically, areas of consolidation are often present; there may be fluid in the pleural cavity, pyopneumothorax or the characteristic pneumatoceles of staphylococcal pneumonia. Coagulase-positive staphylococci may be isolated from nasal, throat and cough swabs or, more significantly, from pus obtained on pleural aspiration in empyema.

The *treatment* of staphylococcal pneumonia consists of supportive measures, combined with appropriate antibiotic therapy. If feeding is impaired hydration should be maintained with oral glucose solution. Oxygen is indicated when there is evidence of anoxæmia. In the presence of empyema daily aspiration of the chest until it is dry is sufficient in most cases. Rarely, open drainage is necessary.

The drug sensitivity of the infecting organism will determine the antibiotic prescribed. If the infant is in hospital or has returned home from hospital the staphylococcus is likely to be penicillin resistant. Time should not be wasted using this drug. If the infant has been born at home a trial of penicillin combined with streptomycin may be justified. For the resistant staphylococcus, erythromycin is probably the drug of choice. It can be given orally, and pædiatric suspensions are available. The dosage should be at least 10 mg./lb. (22 mg./kg.) every six hours. As a means of preventing drug resistance and for possible synergistic effect it is probably best to combine erythromycin with streptomycin (0.1 g. intramuscularly, every six hours). Chloramphenicol is also a useful drug in staphylococcal pneumonia. Its dangers have probably been exaggerated. Although moderate degrees of staphylococcal resistance to it are common, complete resistance is uncommon. 10 mg./lb. (22 mg./kg.) every four hours would be a suitable dosage. The tetracyclines are more likely to cause alimentary upset and to induce staphylococcal enterocolitis.

Bronchitis and bronchiolitis.—Bronchitis may be a mild illness. Capillary bronchitis or bronchiolitis may be severe or fulminating infections. In so far as these diseases are virus in origin specific treatment is not available. Again oxygen may be required and antibiotics will probably be indicated to control any concomitant pyogenic infection or to prevent secondary infection.

Whooping-cough.—Whooping-cough can be a serious disease at this age-period. Antibiotic therapy is probably indicated under two circumstances: in the pre-paroxysmal phase and for the secondary broncho-pneumonia which commonly follows whooping-cough. In the pre-paroxysmal stage, which is more likely to be recognized in a known contact, chloramphenicol 50 mg./lb./day (110 mg./kg.) for seven days has been shown to be of benefit.

Tuberculosis.—Reduction in the incidence of tuberculosis has rendered neonatal respiratory tuberculosis uncommon. Placental transfer of tuberculosis is possible, but is very rare. The presence of tuberculous pulmonary infection in an infant will call for vigorous anti-tuberculous treatment. In the early stages of the disease streptomycin plus isoniazid or PAS, or all three, will be indicated. Later, streptomycin may be omitted. Treatment will have to be given for at least a year. Contacts will have to be looked for to ascertain the source of infection.

Coryza.—Coryza is not uncommon in new-born infants and usually runs a self-limiting course without need for specific therapy. The nasal obstruction which often continues for days or even weeks after coryza may interfere with nasal respiration during feeding. Local decongestant nasal drops (e.g. 7·5 per cent. ephedrine hydrochloride in normal saline) will help to maintain patency of the nasal airways. Such medicaments should be avoided during the acute phase of the coryza because of the risk of middle-ear infection, and they should not be continued for longer than a week or two lest they impair the normal scavenging function of the mucosa.

Thrush.—In an infant who has had oral thrush and for some reason has been treated with antibiotics the development of intractable respiratory infection which does not respond to treatment will raise the possibility of infection with *Candida albicans*. This fungus may be isolated from a cough swab. Treatment with the anti-fungal antibiotic, nystatin, in a dosage of 125,000 units (quarter of a tablet) four times daily, may be indicated.

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THE PREVENTION AND CARE OF RESPIRATORY INFECTIONS IN THE ELDERLY

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Infections of the respiratory tract are the most common cause of illness in all age-groups. Among elderly patients, however, they are potentially lethal. In fact, chronic bronchitis kills more people than either pulmonary tuberculosis or cancer of the lung. So often, a respiratory infection is the final complication which tips the precarious balance in old age. Many a patient with hypertension, cardiac failure or cerebral thrombosis has been stabilized until bronchitis supervenes. The necropsy findings of basal pulmonary œdema with patchy consolidation are common terminal phenomena in so many chronic diseases of later life. Hence the prevention and treatment of the respiratory infections of the elderly are matters deserving careful attention from both general practitioners and specialists.

DIAGNOSIS AND CLASSIFICATION

The clear-cut entities of the textbook are hard to find among aged patients who seem to delight in shifting permutations and combinations of pathology. Pharyngitis, tonsillitis, sinusitis, tracheitis, bronchitis, broncho-pneumonia, asthma, bronchiectasis and lung abscess pass into one another in a manner difficult to diagnose.

One old man of 85 had respiratory-tract infections during four successive years. Each sequence was different. The first began as pharyngitis and went down on the chest, giving a pyrexial bronchitis without any wheezing. The second also started with a sore throat but proceeded to a patch of consolidation with pleurisy. The third took the form of bronchitis with spasm from the start, but showed no real pyrexia. The fourth, and final, attack produced successive patches of broncho-pneumonia which never completely resolved in spite of specific therapy.

On close examination, the differentiation between acute bronchitis and broncho-pneumonia often proves to be fallacious. One patient with a known bronchiectasis was liable to exacerbations of his condition in cold weather. He was watched carefully on a number of occasions to ascertain the first symptoms and signs of an acute flare-up. Eventually we found that the first phenomenon to appear was an increase in respiration rate. Next came slight tachycardia. By the time the temperature was elevated there was x-ray evidence of consolidation. This sequence is not uncommon in elderly patients, whose emphysematous chests may be difficult to examine. It should be remembered that many old people have their 'usual' temperature well below 98.4°F. (36.9°C.).

I remember one Chelsea pensioner with a cough but no definite physical signs and a 'normal' temperature. This led me to withhold specific therapy for twelve hours until his temperature rose to 102° F. (39° C.). On studying the old hospital notes after his death I found that on previous occasions his temperature had always been around 96° F. (35.5° C.).

Generally speaking, the posture of the patient and his rate of respiration are better guides to the severity of his infection than the reading of a thermometer. They are sometimes more reliable than the results of percussion and auscultation when the thorax is emphysematous or deformed.

THE SPUTUM

It is, of course, possible to have an infection of the respiratory tract in the elderly without sputum. Most patients, however, expectorate during the course of the disease. The phlegm, which may be mucoid at first, becomes muco-purulent and then purulent as the condition progresses. Sometimes streaks of blood may be present. In certain cases of bronchiectasis frank hæmoptysis can occur. The amount of sputum varies considerably, but is rarely more than 100 ml. a day, even at the height of the infection. Three layers usually separate out: froth at the top, pus or muco-pus in the middle, clear fluid at the bottom. The more active the infection, the greater is the middle layer.

When sputum is cultured, a number of different organisms may be found. One group, considered pathogenic, includes *Diplococcus pneumoniæ*, *Hæmophilus influenzæ*, Friedländer's bacillus, hæmolytic streptococci and *Staphylococcus aureus*. Another group, considered not pathogenic, contains non-hæmolytic streptococci, *Neisseria catarrhalis*, diphtheroids and other staphylococci. Many elderly patients show profuse growth of pneumococci in their sputum at the onset of an attack of bronchitis. Some authorities, however, consider *H. influenzæ* to be the most dangerous organism. This differentiation is important, since modern attempts at controlling and treating respiratory infections are based upon specific antibiotic therapy. At present, the part played by virus infections is relatively unknown and is therefore omitted from consideration.

PREDISPOSING AND PROGNOSTIC FACTORS

Having considered the seeds of infection, let us glance at the soil in which they take root. Structurally, the mucosa of the respiratory tract may be normal even at the age of 100 years. On the other hand, the power of resistance to bacterial invasion often diminishes in later life. There are many old people, like the case already quoted, who find that a cold in the head 'goes down on to their chest'. Extremes of temperature also affect the aged adversely, so that very cold days are often followed by a respiratory infection. Fog is another well-known lethal agent. The great 'smog' of December 1952 was considered responsible for some 6000 deaths, many of them in the elderly. It is interesting to recall that there was a considerable drop in the

number of fatal cases of respiratory disease among the Chelsea pensioners during the last war when the sick men were evacuated out of London for treatment.

Past disease of the lungs or bronchi seems to predispose to reinfection at a later date. Many cases of chronic bronchitis show the scars of previous pulmonary tuberculosis. As time goes on, progressive emphysema makes its appearance even among healthy old people. The changes are, of course, much more marked in those with periodic respiratory-tract infections. In fact, it may be said that every cough weakens the wall of some alveoli. The loss of healthy epithelium, zones of collapse and streaks of fibrosis left behind each respiratory insult only open the way to a future repetition. There is also a close connexion between respiratory disease and the state of the cardiovascular system. After all, the heart is a pump designed to supply oxygenated blood to the tissues. Its function is impaired by any structural damage to the lungs which renders gaseous exchange less efficient. Too much reduced hæmoglobin in the circulating blood affects the metabolism of the myocardium as well as that of other structures. Hence the danger of congestive cardiac failure, cor pulmonale, cardiac pulmonary œdema or peripheral circulatory failure arising as sequelæ to disease of the lungs.

PREVENTION

Recent investigation has shown a clear connexion between lung cancer and smoking. The relationship with chronic bronchitis is almost as well marked. Therefore cessation of smoking should be one of the first steps in the management of respiratory infections among the elderly. The clinical improvement which can follow this is quite surprising. Early morning cough associated with an irritated pharynx soon ceases to distress the patient and the respiratory tract becomes more placid as a result. The elimination of other trigger factors should also benefit the elderly sufferer. A change of residence from an industrial urban centre to suburb or country is often helpful. I have already mentioned the falling incidence in respiratory deaths during the war among Chelsea pensioners when they were evacuated out of London for treatment. Many of these veterans remained free from symptoms until they came back to the fogs of Chelsea, but the first mist from the river caused a recurrence. The warm moist climate of South Devon has a reputation for elderly bronchitics. The essential point, however, is to remove a patient from those irritant factors which affect his already damaged respiratory tract: tobacco smoke, industrial smoke, fog, and cold damp air, are all likely to do this.

Within the house, sudden changes of temperature from one room to another can precipitate a bout of coughing. For this reason, going from a warm sitting-room into a cold bedroom at night should be avoided. The reactions of the elderly to cold are notably inefficient—hence their tendency to accumulate vests and other undergarments. Their normal skin tempera-

ture tends to be low and may be depressed still further by cold weather. For this reason, old people seem to be more comfortable under conditions of central heating so long as the air is not too dry.

TREATMENT

Since the organisms associated with respiratory infections are known, it would seem logical to employ antibiotics to control them. In practice there are three distinct conditions to consider: (1) The treatment of acute pharyngobronchitis. (2) The management of exacerbations in chronic bronchial infections. (3) The long-term treatment of advanced pulmonary disease.

TREATMENT OF ACUTE PHARYNGOBRONCHITIS

To prevent a cold in the head from going down on to the lungs, it is necessary to give concentrated local therapy. The significant organisms to attack are pneumococci and *H. influenzæ*. In the geriatric outpatient clinic at St. John's Hospital, Battersea, we have been using aerosol therapy in patients with this type of disease. The most useful combination is penicillin and streptomycin, dissolved in saline solution or 10 per cent. calcium chloride. As regards dosage, we began with 100,000 units of penicillin five times daily. More recently, 500,000 units of penicillin and 0.5 g. of streptomycin twice or three times a day have given better results. The solution is vaporized by oxygen in a Collison inhaler, and administered through a face-mask. Various types of hand-operated inhaler have been tried, but all of them require too much physical effort for feeble elderly patients to use. It has been our experience that most cases respond within a few days of starting treatment. By the fifth day, the bacterial flora has changed and is usually resistant to the drugs employed. If clinical signs are marked in the lungs at this stage, no great improvement is likely to follow further aerosol treatment. This form of therapeutics seems best suited to the early stages of a descending infection.

TREATMENT OF EXACERBATIONS OF CHRONIC BRONCHITIS

Exacerbations of chronic bronchitis, as seen in general practice, are often associated with involvement of lung parenchyma. For this reason they can be treated by injections of penicillin, since pneumococci are likely to be the predominant organisms. Penethamate hydriodide ('estopen') is probably the preparation of choice, 500,000 units daily being a satisfactory dose. Chloramphenicol may be used for a short time if the sputum shows a heavy infection of *H. influenzæ* which does not respond well to penicillin. As the drug is toxic to the bone marrow, it is not suitable for prolonged use. An initial dose of 2 g., followed by 0.5 g. six-hourly for five days, has been recommended as free from risk. Should a recurrence take place after a period, the course may be repeated. Some elderly patients show mycotic

infection of the lungs following treatment with antibiotics. *Candida albicans* is the usual organism. The invasion can be severe enough to produce a pneumonia which, of course, does not resolve with the usual treatment. Here, the drug of choice is nystatin, 500,000 units three or four times daily by mouth.

LONG-TERM TREATMENT OF ADVANCED PULMONARY DISEASE

The long-term treatment of advanced pulmonary disease presents a difficult problem. First, it is desirable to control the element of bacterial infection, secondly, pulmonary function must be supported, and thirdly, any associated complications, such as cardiac failure, should be treated.

Control of infection.—The most suitable drug for prolonged administration is probably oxytetracycline, in doses of 0.25 g. three or four times daily during the winter months. This has given good results in a fairly high proportion of cases. It is important, however, to culture the sputum from time to time, in order to check bacterial sensitivity. Any exacerbations can be treated on the lines already indicated.

So far as *pulmonary function* is concerned, gaseous exchange is limited by the degree of emphysema present. It is important to avoid bouts of coughing which further injure the damaged lungs. Proper administration of linctus, especially at night, is desirable. The customary dosage is often too small to produce the necessary effect: 120 to 240 minims (8 to 16 ml.) of opiate linctus of squill B.P.C. may be given without risk. At the same time, it is important to avoid getting the lung bases clogged with viscid sputum. Old folk take postural drainage poorly. Breathing exercises are less helpful than in young people. I have sometimes found that an electric vibrator applied around the lower thorax for a few minutes twice a day helps to loosen sputum and make it easier to expectorate. It is doubtful whether any of the so-called expectorants is effective. Such drugs as ammonium chloride, ammonium carbonate, tincture of ipecacuanha and potassium iodide can be given without making any difference to the amount of sputum produced by the patient. In several experiments, more phlegm was brought up after giving coloured water than after a standard 'cough mixture'; this was confirmed week after week, in a number of different patients.

Complications.—When *congestive cardiac failure* makes its appearance in the course of this group of diseases, it is best to start treatment by giving diuretics. Mersalyl or chlorothiazide ('saluric') once or twice a week is usually satisfactory. Digitalis often disagrees with bronchitic, emphysematous patients. In cor pulmonale there is a high cardiac output type of failure, which is compensatory. This compensation tends to be upset by the effects of digitalis. *Anoxæmia* is an important complication of respiratory-tract disease in elderly patients. Oxygen therapy should not be withheld

until extreme cyanosis occurs. The most effective form of administration is by means of an oxygen tent—which, incidentally, can be hired quite easily. Alternatively, a 'BLB' mask may be used. When *bronchial spasm* is troublesome, ephedrine ($\frac{1}{4}$ grain [16 mg.]) or aminophylline (0.2 g.) may be given three or four times a day. Adrenaline should be reserved for emergencies. It is sometimes difficult to decide whether an elderly patient is suffering from bronchial spasm due to pulmonary disease or from cardiac asthma. In such instances, it is safer to give aminophylline intravenously, since this will benefit either condition.

CONVALESCENCE

After an acute respiratory illness, an elderly patient should be given adequate convalescence. While the bedfast state is bad for the aged, their myocardium takes time to return to normal after a chest infection. Slow, gradual rehabilitation is the rule, using a large comfortable armchair as a domestic gymnasium. The exercise of getting from bed to chair and back again can be of great benefit to the patient. Walking round the chair, with its back as support, is the first excursion to be permitted. Using the end of the bed to pull the body into an upright position is another valuable form of domestic gymnastics. Incidentally, a room temperature of 70°F. (21°C.) or more is desirable for both nursing and rehabilitation of old folk. Exposure to cold will undo much good work.

SUMMARY

Infections of the respiratory tract are both frequent and dangerous in later life.

Among predisposing factors are smoking, fog and cold.

The common infecting organisms of importance are pneumococci and *Hæmophilus influenzæ*.

Prompt treatment with antibiotics is essential for good results.

Prolonged convalescence is desirable.

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THE EMERGENCY TREATMENT OF CONVULSIONS IN CHILDHOOD

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A WIDE range of drugs is available for the emergency treatment of convulsions in childhood. The most frequently recommended barbiturates are phenobarbitone sodium, amylobarbitone sodium and quinalbarbitone sodium; other drugs often used include paraldehyde, chloral hydrate and bromethol. Clearly, circumstances may influence the choice of agent and its method of administration; for instance, it may not be easy to find a suitable vein in a young child, inhalational anæsthesia in an unprepared patient who might vomit is inadvisable unless suction facilities are available, and drugs liable to depress respiration may be hazardous in general practice.

SCOPE OF INVESTIGATION

The aim of the present investigation was to find a drug which was effective in controlling seizures but produced no undesirable side-effects in the dosage employed, and could be given intramuscularly. Such a drug would be suitable for use in general practice. The two most generally used drugs —phenobarbitone sodium and paraldehyde—were chosen for comparison and the dose given based on body weight. The dose of phenobarbitone sodium was 0.5 grain per 10 pounds (6 mg. per kg.) body weight, and of paraldehyde 1 ml. per 10 pounds (0.25 ml. per kg.) body weight. The weight of the patient was estimated to the nearest 5 pounds (2 kg.) and in actual practice this was found to be sufficiently accurate.

The cases treated were those children aged between 2 weeks and 7 years who arrived at the Hospital for Sick Children, Toronto, between October 1954 and March 1956 in a convulsion, not already having had treatment and in whom the history and observation for a short period after arrival suggested that the convulsion was not stopping spontaneously. The reason for the proviso is that in any unselected group of seizures the majority last for less than twenty minutes without any treatment at all and therefore any drug given before then is likely to appear effective. For the same reason no cases of convulsions occurring in a patient already in hospital were included. In a series of 500 children arriving at hospital during or just after a convulsion and without treatment, it was found that 67 per cent. of seizures had lasted less than fifteen minutes, 16 per cent. between fifteen and thirty minutes, and 17 per cent. over thirty minutes. As a rule, a child had been in the seizure for some time before hospital was reached, usually twenty minutes or more, but even so during the period of investigation it was found possible to treat only 29 patients on thirty-two occasions.

The drug to be given was pre-selected on a random basis. The original scheme of treatment called for the administration of the calculated dose of drug on arrival, and for half the calculated dose at twenty-minute intervals for two further doses before considering the drug to be ineffective. For two reasons this scheme was not followed completely:—(a) As already stated, most of the children arriving in a convulsion had already been in this state for an appreciable time and, as it is possible that prolonged seizures may produce brain damage, it was felt that treatment should if necessary be modified after the first injection. (b) As the study progressed, it became clear that the two drugs produced their maximum effect very quickly. Usually some effect was apparent within five minutes of the injection and thereafter the seizure either improved steadily or returned to the previous state of severity. Consequently it was difficult to decide whether further smaller doses of the drug were effective or the seizure had stopped spontaneously.

Each case was observed continuously from the time of arrival until the seizure stopped, and note made of the clinical state, pulse, respirations and blood pressure. Oxygen was given routinely and occasionally a child with high fever was sponged with dilute alcohol. Suction was used to clear the respiratory tract and to empty the stomach.

RESULTS

Twenty-nine patients were treated on thirty-two occasions; paraldehyde was used sixteen times and phenobarbitone sodium fourteen times, whilst in two patients single injections of both drugs were given on the same occasion. Cases were treated before full investigation of the cause, since it is desirable to prevent a prolonged seizure, whatever the etiology may be.

Paraldehyde.—The age of the patients treated ranged from 5 months to 6 years 11 months. The drug was effective on twelve of the sixteen occasions. In ten instances only one injection was required, the seizure stopping within five minutes in five patients, in ten minutes in two more and in fifteen minutes in three. In two patients two injections were required and in both the seizure stopped in thirty minutes. No side-effects were apparent in any case either at the time of the convulsion or later. In four instances the drug was not effective. In three of these, two injections were given and after thirty minutes' observation the seizure was stopped, using ether anæsthesia. In the fourth case, only one injection was given because the convulsion had lasted for over an hour at the time of arrival and because previous convulsions had responded only to inhalation of ether. No side-effects occurred in these patients.

Phenobarbitone sodium.—The age of the patients ranged from 1 year to 6 years 10 months. The drug was effective on eight of the fourteen occasions. In six instances only one injection was needed; the remaining two cases required two injections. Respiratory depression occurred in five patients and was mild in one case, moderate in three cases and severe in one. Two

patients needed intubation and assisted respiration and in two cases emergency bronchoscopy was done in case secretions in the bronchial tree were contributing to the anoxia. No other side-effects were noted. In six patients the drug was ineffective. One patient received three injections and the

Age (yrs mths)	Sex	Dose of paraldehyde (ml.)	Seizure	Notes
2 6	M	4.5	Right-side seizure for 30 minutes before treatment.	Not effective in 15 minutes. Controlled with ether.
2 7	M	5	Asymmetrical, right more than left. Lasted 20 minutes before treatment.	Not effective in 15 minutes. Controlled with ether.
2 5	F	4.5	Right-side seizure for about 10 minutes before treatment.	Not effective in 15 minutes. Developed abscess of injection site.
6 10	M	6	Generalized but more right than left. Lasted 20 minutes before treatment.	Effective in 5 minutes. No side-effects.
2 11	M	5	Left-side seizure for 25 minutes before treatment.	Effective in 10 minutes. No side-effects.
1 9	F	4.5	Generalized for 25 minutes before treatment.	Effective in 10 minutes. No side-effects.
2 8	M	5	Asymmetrical for over an hour before treatment.	Not effective. Seizure stopped only with great difficulty and patient subsequently died.
0 11	F	3.5	Generalized for 30 minutes before treatment.	Effective in 5 minutes. No side-effects.
1 0	F	3	Generalized for 30 minutes before treatment.	Effective in 5 minutes. No side-effects.

TABLE I.—Details of cases of convulsions in children, treated with paraldehyde (1.5 ml. per 10 pounds [0.35 ml. per kg.] body weight).

remainder two. None of these patients developed depression of respiration or other side-effects. The seizures in these patients were controlled by ether inhalations in five cases and by intravenous amylobarbitone sodium in the remaining case.

Both drugs.—The two patients were aged 6 months, and 2 years 5 months, respectively, and each received one injection of each drug. The full dose of each drug was given, the second drug twenty minutes after the first. In neither instance was the convulsion controlled, so each drug can be considered to have failed in these cases.

The following tentative conclusions may be drawn from this limited series:—

(a) Paraldehyde is more effective than phenobarbitone sodium in controlling a convulsion.

(b) In the dosage used there are no side-effects with paraldehyde.

(c) If the dose of phenobarbitone sodium is adequate to control the convulsion, it may produce respiratory depression.

In view of the 25 per cent. failure rate with paraldehyde, it was decided to increase the dose to 1.5 ml. per 10 pounds (0.35 ml. per kg.) body weight and this increased dose was used on nine occasions in eight patients. Only

a single injection was given. The results are shown in table I. In four of the nine instances the single injection failed to stop the convulsion. There were no systemic side-effects although one patient developed an abscess at the site of injection. Experience in the wards and outpatient departments showed that abscesses were liable to occur at the injection site if too much paraldehyde was injected at any one place, or if the injection was not deeply intramuscular. For these reasons it is wise to restrict the dose at any one site to 3 ml. and to take special care with the injection. Increasing the dose of paraldehyde still further would cause practical difficulties without the guarantee that all convulsions can be stopped by this means.

Since the larger dose of paraldehyde (1.5 ml. per 10 pounds [0.35 ml. per kg.] body weight) is safe, it is reasonable to use it rather than the smaller dose and it was clear that within ten minutes of the time of injection it was possible to say with reasonable confidence whether the seizure would, or would not, stop. A decision about using other methods to stop the seizure could be made at that time.

ADDITIONAL METHODS OF TREATMENT

In hospital it is easiest to use *general anæsthesia* to control a severe convulsion but the time-honoured procedure of pouring ether on a mask in the casualty department is not perhaps the best one. The following features in these patients are noteworthy:—(a) They frequently have upper respiratory infections; (b) they have had no premedication; (c) they have respiratory difficulty and excessive bronchial secretions because of the convulsion, and they are probably anoxic; (d) they are liable to vomit; (e) considerable depth of anæsthesia may be necessary.

The hazards of general anæsthesia may be minimized by the following precautions:—

(1) If an intramuscular anticonvulsant is given first it is found that induction is smoother and easier.

(2) The stomach should be emptied by suction and the respiratory passages cleared as often as necessary.

(3) If an experienced anæsthetist is not immediately available then oxygen, a laryngoscope and an endotracheal tube should be at hand.

(4) The blood pressure should be noted frequently and, if necessary, steps taken to maintain it.

The management of the resistant convulsion is an emergency requiring a skilled anæsthetist, since it is impossible to forecast at the first examination which patients will respond to treatment and which will not.

Paraldehyde may also be given *intravenously* and has the advantage that it has a brief action and so does not introduce complications if other medication is desired at any time. It is usually given diluted in saline (2 ml. of paraldehyde diluted to 20 ml. with saline) by means of a Y-connexion to an intravenous drip. No ill-effects have been seen as a result of this method of administration.

On theoretical grounds the use of *hypothermia* may have a place in the treatment of severe seizures.

RECOMMENDATIONS

From the experience gained in the treatment of convulsions in childhood, the following recommendations for management are made:—

In General Practice

(1) Give intramuscular paraldehyde, 1.5 ml. per 10 pounds (0.35 ml. per kg.) body weight.

(2) Send the patient to hospital if (a) there is no improvement in ten minutes, (b) the primary cause requires further investigation or treatment.

In Hospital

(1) Give oxygen and clear the respiratory passages.

(2) Give the appropriate dose of paraldehyde if this has not already been given before arrival.

(3) Empty the stomach.

(4) Consider the use of other forms of treatment, if these are indicated, and other diagnostic measures.

(5) If the seizure is uncontrolled after fifteen minutes, prepare to anæsthetize, preferably by an anæsthetist.

Children still die as the result of severe convulsions. The cause of death is rarely obvious but it is possible that injudicious use of drugs in treatment may lead to respiratory depression and irreversible anoxic changes. It is felt that this possibility can be avoided.

SUMMARY

(1) The use of intramuscular paraldehyde is compared with that of intramuscular phenobarbitone sodium in the emergency treatment of convulsions in children.

(2) Paraldehyde was used sixteen times with four failures. The dose used was 1 ml. per 10 pounds (0.25 ml. per kg.) body weight. No side-effects were seen. A larger dose, 1.5 ml. per 10 pounds (0.35 ml. per kg.) body weight, was used on nine occasions, and no side-effects were seen.

(3) Phenobarbitone sodium was used fourteen times with six failures. The dose used was 0.5 grain per 10 pounds (6 mg. per kg.) body weight. Respiratory depression occurred in five patients and was severe in one.

(4) Paraldehyde is more effective and less toxic than phenobarbitone sodium.

(5) If the convulsion cannot be stopped by a single injection of the recommended dose of paraldehyde, a general anæsthetic should be given.

(6) Recommendations for the management of the convulsion are given.

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PSYCHOLOGICAL SYMPTOMS OF ORGANIC SIGNIFICANCE

A PLEA FOR THE PSYCHOLOGICAL APPROACH IN DIAGNOSIS

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In a recent work, 'The evolution of medical education in the nineteenth century', Newman (1957) states that in 1800 the important thing was 'what the patient thought' about his trouble: he goes on 'The important thing became later what the doctor found, and today may even be, rather, what someone else reports from the laboratory. The gradual eclipse of the patient is a warning to be observed: it carries a lesson for the future'.

The nineteenth century was to see the creation of clinical science. The rapid advance of the physical sciences, the emphasis on morbid anatomy and the cellular theory of Virchow, were to prove so attractive that attention inevitably came to be directed to tissues and objective features, to the recognition of physical signs and to what was felt to be a more scientific and inductive attitude towards diagnosis. So far as it went, this was all to the good, but one result was that diagnosis became a more localized and less total formulation. To be sure, there were brilliant exceptions to this mechanistic process and they were usually to be found among the most gifted clinicians, such as Sir Clifford Allbutt. But the wonders of biochemistry, pharmacology and bacteriology could not fail to fascinate and claim attention, to the exclusion of a then rather vague and anæmic psychology, until well into the present century.

THE RETURN TO THE PATIENT

From time to time extravagant claims have been made for psychiatry, though not usually by experienced psychiatrists: but one claim, it is here submitted, can fairly be made: that the psychiatry of at least the last thirty years has developed a method of clinical investigation which makes possible a return to the patient in a very total way. At a time when it was beginning to be thought that the vein of clinical observation had been fully worked out, the bare outline of the patient's medical history, as previous generations knew it, has been reinforced by a biological and sociological approach. Further, to objective assessment has been added the subjective method. Whereas previously the patient's subjective observations were valued mainly for their content, with results the usefulness of which varied according to the reliability of the patient as a witness, his statements can now, irrespective of their accuracy, be evaluated according to the manner of their telling in such a way as to assist in diagnosis. Moreover, and from the objective standpoint, more exact study can be made of the mental sympto-

matology and, with the aid of clinical psychology, standardized tests have been devised which can help in detecting impairments of cerebration, and in distinguishing between those representing disturbances of mental function and those due to structural brain damage.

This return to a holistic conception could mean that, far from being at the end of clinical observation, we are, if this newer orientation be allowed, at a beginning. Properly developed, psychological methods of investigation could provide a diagnostic instrument of great delicacy and one capable of recognizing at least some of the more chronic types of disease at an earlier stage. Until comparatively recent times in the diagnosis of disease of, say, the central nervous system, the physician was compelled to rely upon the objective results of careful clinical examination. Only when physical signs were present could he feel satisfied that the presence of organic disease was established: but by the time these could be confirmed it was often relatively far advanced. Special studies employing biochemical means, contrast media, and electroencephalography have added refinements in early detection upon which we are dependent. But these can hardly be applied at random or as a routine and it is on the clinical features that we must still rely to suggest their use. Two important ways in which attention to psychological factors may help are, first, the fact that mental changes may precede the appearance of physical signs by a considerable interval of time and, second, that a biographical history, interviews with relatives, and the application of psychometric tests may uncover some scrap of information which is out of keeping with any purely psychiatric diagnosis and reveal in a moment that the case is in the organic field.

CLINICAL APPLICATIONS

In his classical description of pernicious anæmia, Thomas Addison (1855) included mental symptoms. In 1929, McAlpine called attention to the mental changes which might occur in pernicious anæmia. Not only did he refer to their nature, varying in severity from depressive symptoms and loss of mental energy to more overt psychotic states, he emphasized that these, like the other neurological symptoms, might precede the characteristic blood changes by many months. He called for more frequent examination of gastric contents and blood in cases of neurosis and psychosis occurring for the first time after the age of 35. More recently, MacDonald Holmes (1956) showed in a study of fourteen cases how cerebral symptoms preceded the appearance of Addisonian anæmia or of spinal and peripheral nerve involvement by, in some instances, several years. The following clinical example may illustrate the point:—

F.D.K., aged 54, an electrician, was referred to the department of psychological medicine at the Liverpool Royal Infirmary by his family doctor on February 11, 1957. He complained of soreness of the tongue, difficulty in swallowing, lack of appetite, pruritus ani, progressive bodily weakness, dryness of the mouth and disturbance of taste. He gave a history of being in good health until 1952 when he began to notice soreness of the tongue. In 1953 he started to suffer from fits of mental depression and on this account, in 1955, he was admitted to a mental hospital

where he had some electroconvulsive therapy. By the Spring of 1956 he was attending a dermatologist for pruritus ani and was by him referred to a general physician. Apart from marked emphysema and chronic bronchitis no physical abnormality was found, but the patient was described as being 'very talkative and almost hypomanic'. His tongue symptoms were considered to be of psychogenic origin.

When seen at the Royal Infirmary his symptoms were regarded as suspicious of organic disease, but it is only fair to say that his complaints of dysphagia and disturbance of taste could not be substantiated objectively. On the other hand, there was no doubt that his tongue was acutely tender, he had a slurring dysarthria and a nasal intonation. Two subjective observations were regarded as being significant: the patient volunteered that he could no longer wrestle with his son who was now able to push him around at will; and the patient's wife described how during the previous five or six years he had changed completely in personality. Whereas, before, he had always been ready to help, had a liking for going out socially and been the life and soul of the party, he had become irritable and bad-tempered.

At this point it was deemed wise to refer him to a neurologist. Again, the result of careful clinical examination was inconclusive, and no dysarthria was noticeable, but by May 4, the patient's blood count was described as 'very suggestive of pernicious anæmia'. He was admitted to hospital for full investigation. By October 1957 he had made a complete recovery physically and mentally. His blood count had returned to normal following administration of high-dosage intramuscular vitamin B complex, but excluding vitamin B_{12}. The hæmoglobin was 113 per cent. The diagnosis, in fact, was not one of pernicious anæmia but of early pellagra.

The point of this illustration is that the appearance of mental symptoms preceded the establishment of an accurate diagnosis by six years, and that subjective physical complaints—in this case soreness of the tongue—were attributed to psychogenic cause.

Among cases referred on mental grounds for psychiatric opinion, but which prove to have an organic explanation, disease primarily affecting the nervous system—multiple sclerosis, neoplasms, extrapyramidal syndromes—naturally accounts for a fair proportion (Hall, 1936); but other pathological conditions, such as hypothyroidism (Asher, 1949), of a degree that would hardly justify the designation of myxœdema, must be included. From the standpoint of social medicine it is significant that cancer of the lung has recently had to be added to the list, two such cases being referred to our Royal Infirmary clinic during the past twelve months.

AIMS OF A PSYCHOLOGICAL APPROACH

It is necessary here to emphasize two points: in the first place, it is not the function of this article to pontificate on the subject of diagnosis, because it is clear that we as psychiatrists have as yet hardly begun to exploit the diagnostic possibilities of our specialty, as physicians who have investigated patients previously subjected to psychiatric treatment may bear out. Secondly, it is not a plea for the negative policy of regarding all patients who complain of psychological symptoms with suspicion and subjecting them to exhaustive investigation, the effect of which may only influence adversely the patient concerned. The aim is the positive one of trying to discern what psychological symptoms may definitely be regarded as of organic significance, and employing the knowledge gained in a planned diagnostic approach. When the modern advances in treatment—neuro-

surgical, antibiotic, hormone, vitamin, to name but a few—are considered, the importance of such a quest becomes evident.

PSYCHOLOGICAL SYMPTOMATOLOGY

In designating psychological symptoms which represent an expression of organic disease, it would seem advisable to employ a distinguishing term. Previously, the word 'psychopathological' has been used (Bleuler, 1951), but this adjective is more appropriately applied to mental processes that are primarily of psychogenic origin—the sense in which it has been most commonly employed hitherto. Accordingly, the term 'patho-psychological' is suggested, since it is felt that this might convey an emphasis on *pathology*, as used in the commonly accepted sense. Psychological symptoms might thus be grouped as follows:—

(1)	Psycho-pathological . .	. . Of psychogenic origin.
(2)	Psycho-somatic . .	. . Of an actual bodily disorder contributed to / aggravated or / precipitated by } psychogenic factors.
(3)	Somato-psychic . .	. . Arising from, and secondary to, the patient's *reaction to* having a bodily disease.
(4)	Patho-psychological . .	. . Of organic origin and therefore an *expression of* bodily disease.

It is with the fourth category that this article is concerned.

'PATHO-PSYCHOLOGICAL' SYMPTOMS

(1) What are these 'patho-psychological' symptoms? (2) What help may they be capable of giving?

In the first place it is apparent that negative findings as a result of physical examination, and even of more detailed studies, do not in themselves exclude the presence of organic disease. The diagnosis of psychoneurosis is not properly made by a process of exclusion: certain positive requirements are necessary. In their absence, a presumption in favour of organic disease should remain.

Turning to the psychological symptoms, these may be said to fall into two categories: those which relate directly to mental function, whether of thought, mood or conduct, and subjective complaints, or events in the history, the significance of which may be elucidated by psychological means.

In the former category must be included the three groups of symptoms commonly associated with organic cerebral disease and referred to under the designations: 'clouding of consciousness', the dysmnesic or amnestic syndrome, and dementia. Of these syndromes, a salient feature, and one common to all three, is impairment of cognitive function. So-called clouding of consciousness usually manifests itself in disorder of awareness, impaired perception, or mental confusion such as may characterize an organic psychosis, whether arising from some generalized toxic condition or from disease localized within the cranium. Depending upon the nature of the

underlying somatic disease and its progress, delirium, 'twilight states' or coma may ensue; or, with physical recovery, the mental changes may prove completely reversible. These psychological symptoms are thus to be found more commonly as accompaniments to acute or subacute conditions.

Although the terms 'dysmnesic' and 'amnestic' suggest predominantly, and rightly so, memory change, the mental disturbances covered by the syndrome of that name are more inclusive than it might imply. Here the patient may be fully alert, indeed mentally overactive, but in addition to showing impairment of recent memory and, perhaps, confabulation he is seen to be grossly defective in thought processes, even in orientation. Such a state, classically associated with the name of Korsakow, may occur on the road to recovery from severe head injury, or characterize the more chronic organic psychoses associated with poisons, infections, deficiencies or cerebrovascular disease. The dementias represent further stages in degenerative, and correspondingly deteriorative, processes. It is important to emphasize that in all these syndromes, whatever the pathological background, the mental symptomatology may be coloured by the previous personality features peculiar to that particular patient, not to mention such personal and purely psychogenic problems as may be concerning him at the time.

Although these mental symptoms and signs may be of assistance in diagnosis, they may not afford very early indication of organic disease, somatic evidence of which may already be apparent. For the finer points we must rely on the more subtle clues. For exampie, the psychoneurotic is often on the defensive against explanation of his ailment in terms of emotional disturbance, and often clings to one of physical disease; so that a patient who protests that his trouble is of purely psychological origin must be immediately 'suspect'. Unconsciously sensing the real nature of his illness, he attempts to play down any physical disability and, in response to the dictates of wishful thinking, is at pains to prove to himself that his symptoms are due to lack of confidence or to connect them with some emotional experience. Again, any reported change of personality, inexplicable irritability of temper, actions that are out of keeping with a patient's previous traits must arouse suspicion. It may be only one symptom that does not fit in with an otherwise clear psychiatric diagnosis, but its importance may outweigh all the others.

In 1943, a woman of 51 was referred with symptoms of mental depression. I found her to be suffering from a frank depressive psychosis characterized by ideas of unworthiness, suicidal thoughts, retardation of thought processes, emotional instability, severe insomnia and anorexia. It was confirmatory that the patient had experienced a similar breakdown twenty-one years before. One feature, only, was out of character: she had gained in weight—in a condition wherein weight loss is the usual accompaniment. Although this finding was sufficiently striking for me to underline it on the case sheet, preoccupied with the severity of the psychiatric illness and the need for treatment I virtually ignored my own observation. Thirteen years later, now 64 years of age, she was referred again. Again she was suffering from a depressive psychosis characterized by the symptomatology and findings closely similar to those of the former attack. She was given electroconvulsant therapy, and recovered. But three years previously she had been diagnosed as suffering from

myxœdema and effectively treated. The two conditions were certainly distinct, but had I paid more attention to the anomalous gain in weight ten years earlier, treatment for the hypothyroidism might have been initiated several years sooner.

Incidentally, in any neuropsychiatric examination it is wise to have the patient give a specimen of his handwriting. His response to the request, which should, of course, be for something more than his name and address, may be revealing. Not only may the calligraphy itself be indicative of neurological disease; the patient, though having successfully complied with demands of the examination to that point, may, when he is asked to write, show certain peculiarities, or indeed prove quite unequal to the task.

It is emphasized that it is on subjective, as distinct from objective, observations that we are often dependent for our clues. These may consist of spontaneous remarks—which, incidentally, it is useful to record verbatim —let fall by patients or relatives, or responses to specific questions, even leading ones, by the examiner. In this connexion an example of what not infrequently proves a fertile clinical field is that of bladder function. For some reason doctors still have a tendency to regard patients who cannot manage their bladders, but who are cystoscopically negative, with suspicion, or as being in some way unsatisfactory people. Thus, frequency is apt to be equated with fussiness or anxiety, retention with hysteria, and an episode of diurnal enuresis, particularly when it coincides with emotional stress, regarded as sheer lack of self-control.

The wife of a foundry supervisor aged 49, who made no complaint on his own part but was noticed to have become disinclined for work, was asked whether he had ever lost control of his bladder. 'No' she said and then, after a brief pause, 'only once' (two weeks previously). The subsequent diagnosis was one of cerebral tumour.

Not to be overlooked is the inappropriate or facetious remark that is out of character.

A serious-minded middle-aged man of irreproachable morals and way of life, who was asked during the course of physical examination if he had ever had any venereal trouble, replied 'No—not yet', thereby indicating at once the organic nature of his illness.

LIMITATIONS AND SCOPE OF THE PSYCHOLOGICAL APPROACH IN DIAGNOSIS

It is now necessary to consider what help psychological symptoms may give. Here a debt must be acknowledged to Manfred Bleuler (1951).

'Psychopathological alterations', he wrote, 'are one of the earliest and most important signs of brain disease. Understood in the right way they are of the greatest diagnostic importance . . . If the psychopathological study of a patient can demonstrate whether he is suffering from a brain disease or not, psychopathological findings cannot be ignored. In many cases they will prove to be even more important than pneumoencephalographic, electroencephalographic, or spinal fluid findings'.

To take the negative aspect first, it must be admitted that pathopsychological symptoms may throw little light on the pathology of the organic mischief. As has already been noted, the presence of, for example, the dysmnesic syndrome will in itself yield little information concerning the disease causing it, whilst the mental symptoms in a case of dementia

paralytica may owe more to the previous personality of the patient than to spirochætal infection in the tertiary stage. Secondly, subject to certain notable exceptions, psychological symptoms may give little indication as to site of lesion. Among the exceptions may be included aphasias, apraxias and agnosias of different kinds; major sleep disturbances such as may be encountered with hypothalamic lesions; the states of 'dreamy unreality' classically associated by Jackson with the uncinate region, and the various types of hallucinatory auræ met with in the temporal lobe epilepsies.

As has been shown, the mental symptomatology may indicate in certain cases whether the illness is organic or non-organic—admittedly an artificial distinction, albeit a useful one—and do so well in advance of other information. Further light may be thrown on the acuteness or chronicity of disease, or on the speed of its development, according to whether clouding of cerebration, or disintegration of function, predominates. Patho-psychological symptoms may be markedly influenced by the age of the patient; pathological changes which in middle life might be expected to interfere more particularly with cognitive function may, in the growing child, be associated rather with gross character change or defect. Finally, psychological symptoms may yield some slight evidence concerning the diffuseness or circumscription of the lesion, general cognitive impairment pointing more, perhaps, to the former, and emotional disturbance to the latter.

SUMMARY

Reference is made to the part played by psychiatric and psychological methods of investigation in the 'return to the patient' and a more holistic conception in diagnosis. The view is expressed, and exemplified clinically, that psychological methods of investigation could be developed as an instrument of great delicacy in the positive diagnosis of organic disease as distinct from diagnosis by exclusion. The aims and present scope and limitations of the psychological approach in diagnosis are mentioned, and some of the psychological symptomatology of organic significance is described. It is suggested that the term 'patho-psychological' be applied to symptoms in this category, to distinguish them from the 'psycho-pathological' symptoms which have come to be regarded as of psychogenic origin.

I wish to express my thanks to Dr. Robert Hughes, consultant physician at the Royal Southern Hospital, Liverpool, and his staff for their valuable assistance in the diagnosis of patients referred to in this article.

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TRIAL OF AN IRON CHELATE IN THE TREATMENT OF THE ANÆMIA OF PREGNANCY

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It is now well recognized that a large number of pregnant women develop an iron-deficiency state which may manifest itself as anæmia during the later months of pregnancy. Oral iron therapy will correct most of these anæmias but many preparations are not well tolerated, especially during the later months of pregnancy. Gatenby and Lillie (1955) found that 48 per cent. of pregnant women could not tolerate ferrous sulphate and 8 per cent. could not tolerate ferrous gluconate.

THE RATIONALE

For some time it has been known that amino-acids, proteins and hydroxy-acids when combined with a heavy metal such as iron will prevent the metal displaying some of its normal reactions. These ring-like complexes have been called chelates. Iron is absorbed in the ferrous state and it is generally supposed that it is ferric iron which causes gastro-intestinal upset. Ferrous sulphate is especially liable to oxidation; hence it is a common custom to give ascorbic acid at the same time in an attempt to prevent this. Organic iron salts have been introduced as therapeutic agents as being less likely to cause gastric disturbance.

An iron chelate in which the iron is in a way enclosed by organic molecules (*chele* = crab's claw) would appear to present certain advantages. Such a chelate is ferrous aminoacetosulphate, an amino-acid chelate of ferrous sulphate. When exposed to the atmosphere for three months it shows no oxidation to ferric iron. Nor is it precipitated in alkaline solution even at a pH much higher than is normally found in the human gastro-intestinal tract, whereas ferrous sulphate produces a heavy precipitate (Arden, 1950). Furthermore, it is feasible that siderophilin, the iron-carrying β-globulin, transports the iron in the form of a chelate. If the blood stream tolerates an iron chelate then it seems reasonable to suppose that such a compound will be tolerated by the gastro-intestinal tract and its absorption be rapid and effective. Jacobi, Pfleger and Rummel (1956) have shown that amino-acid-iron chelates do pass through the intestinal wall rapidly and in high concentration. Recently reports have appeared of promising clinical trials in non-pregnant patients with ferrous aminoacetosulphate (Jorgensen, 1955; Pomeranze and Gadek, 1957). Consequently it was decided to carry out

a clinical trial in pregnant women, using the chelated compound, ferrous aminoacetosulphate.

SCOPE OF INVESTIGATION

In the first instance, 20 patients with hæmoglobin levels of 71 per cent. (10.5 g.) or less, who were less than 34 weeks pregnant were given 1 tablet

	No. of patients	Hæmoglobin (per cent./100 ml.)		
		Initial	After 2 weeks	'Final'
Chelate	20	67	77	85
Gluconate	20	68	73	78

TABLE I.—Comparison of results obtained with ferrous gluconate and ferrous aminoacetosulphate in 40 pregnant women with anæmia. The 'final' hæmoglobin was the last estimation made before the patient was delivered and varied in timing from 6 to 14 weeks after the start of treatment.

of ferrous aminoacetosulphate three times a day and the same number of patients with similar hæmoglobin levels and at a similar stage of pregnancy were given 1 tablet of ferrous gluconate three times a day. The iron content

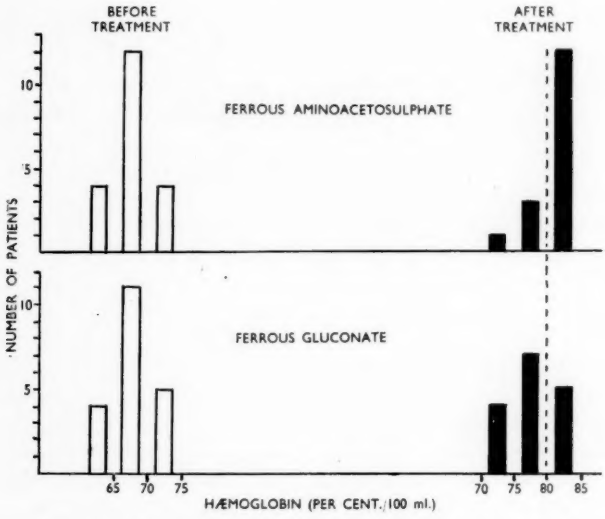

FIG. 1.—Distribution of hæmoglobin levels before and after treatment with ferrous gluconate and with ferrous aminoacetosulphate.

of each chelate tablet was 53 mg., whilst that of each gluconate tablet was 49 mg. The tablets were sugar coated, identical in size and colour and had similar disintegration times. Later the number of patients treated with the

chelate was increased to 55. All hæmoglobin estimations were done on one photoelectric colorimeter using oxyhæmoglobin, which was checked regularly by the M.R.C. blood samples, and 100 per cent. = 14.6 g./100 ml.

RESULTS

The initial hæmoglobin of the two groups was similar before treatment. Two of the patients taking gluconate complained of vomiting and nausea

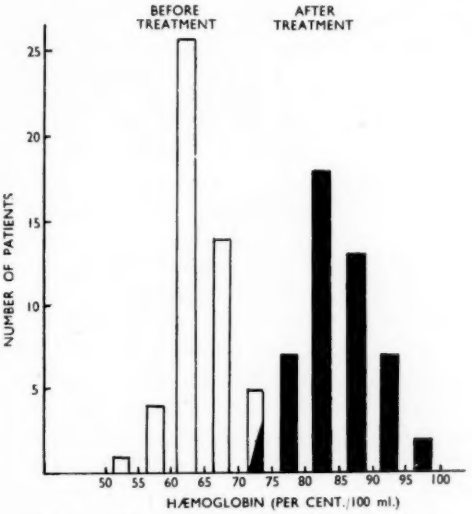

FIG. 2.—Distribution of hæmoglobin levels in 51 patients before and after treatment with ferrous aminoacetosulphate.

whereas none of those taking the iron chelate had gastric disturbances. Three of the latter group, however, did complain of headache which suggests a rapid absorption of iron, as this symptom has been noticed in patients receiving parenteral iron preparations (Jennison and Ellis, 1954). The rapid absorption of the iron chelate is also suggested by the rapid increase in hæmoglobin in the first two weeks as shown in table I: the fastest increase took place at this time, thereafter a slower rate of increase in hæmoglobin was apparent for several weeks. The patients on ferrous gluconate were much slower to respond and never reached the levels attained by the women taking the chelate. In each group 16 patients were followed for six weeks or more and the increase in hæmoglobin levels before delivery shows a marked difference which is statistically significant ($t = 3.2$ $P < 0.01$). The final hæmoglobin estimations (fig. 1) showed that only 5 out of 16 (31 per cent.) of the patients on ferrous gluconate had

reached 80 per cent. or more, whereas 12 out of 16 (75 per cent.) of the patients treated with ferrous aminoacetosulphate had reached this level.

In the main group only two patients could not tolerate ferrous aminoacetosulphate and could, or would, not take any form of oral iron. Two

	No. of patients	Hæmoglobin (per cent./100 ml.)			
		Initial	After 2 weeks	After 4 weeks	'Final'
Below 61% (9 g.)	13	59	72	77	85
Above 61% (9 g.)	38	66	75	78	84
	51	64	73	78	84

TABLE II.—Results of treatment with ferrous aminoacetosulphate in 51 pregnant women with anæmia. The 'final' hæmoglobin was the last estimation made before the patient was delivered and varied in timing from 6 to 14 weeks after the start of treatment.

more patients who did not respond were found to have a megaloblastic anæmia.

The results with the remaining 51 patients treated with iron chelate are similar to those obtained with the initial group: an increase from 64 per cent. to 73 per cent. in two weeks with a level of 84 per cent. for those followed for six weeks or more. The distribution of the hæmoglobin levels before and after treatment is shown in fig. 2. As is usual with most anæmias the more anæmic patients showed a more rapid response (table II) and had nearly drawn level with the less anæmic patients in four weeks. In pregnancy the more anæmic patients are often discovered earlier in pregnancy and consequently behave more like non-pregnant patients (Jennison and Ellis, 1954).

DISCUSSION

It would appear that ferrous aminoacetosulphate is rapidly absorbed and is almost free from gastro-intestinal disturbance in pregnant women. In the controlled series the weekly rate of hæmoglobin increase in the first two weeks was 5 per cent. (0.74 g.) with the chelate, compared with 2.5 per cent. (0.37 g.) with gluconate. Over the first four weeks the average weekly increase in hæmoglobin was 2.75 per cent. (0.41 g.) with the chelate and 1.75 per cent. (0.26 g.) with gluconate. In the more anæmic patients the weekly increase over the first two weeks was 6.5 per cent. (0.96 g.) and 4.5 per cent. (0.66 g.) over four weeks. In the total group of 51 women the over-all increase in hæmoglobin from the beginning of treatment until just before delivery varied from 8 per cent. to 33 per cent. with an average of 20 per cent. The average weekly increase was 4.5 per cent. (0.66 g.) over two weeks and 3.25 per cent. (0.48 g.) over four weeks.

These increases in hæmoglobin level in the early weeks of treatment suggest rapid absorption and utilization of iron in this form and are better than the results obtained in pregnancy with the usual oral iron compounds.

Using ferrous sulphate and ferrous gluconate, Gatenby and Lillie (1955) obtained in women whose initial hæmoglobin was below 9 g. an average increase of 2.5 g. (17 per cent.) after twelve weeks' treatment. With ferrous aminoacetosulphate we have obtained an average increase of 2.9 g. (20 per cent.) before delivery although many of the patients had not been treated for as long as twelve weeks, and for the patients with initial hæmoglobin levels below 9 g. the increase was 3.85 g. (26 per cent.). Holmes (1957), using iron calcium lactate, recently reported an average weekly increase of 0.6 g. in the first two weeks with the more anæmic pregnant women (below 8 g.), whereas using ferrous aminoacetosulphate we obtained 0.96 g. a week for two weeks and 0.66 g. a week over four weeks in women whose initial hæmoglobin was below 9 g. Its freedom from gastro-intestinal disturbance makes it particularly suitable for use in pregnancy.

Furthermore, for our cost-conscious health service it may be noted that, although ferrous aminoacetosulphate is more expensive than ferrous sulphate, it is less expensive than most other iron preparations. The basic National Health Service price of 100 tablets of commonly prescribed proprietary brands is: 5*d.* for ferrous sulphate compound, 3*s.* 4*d.* to 3*s.* 8*d.* for ferrous gluconate, 3*s.* 11*d.* for ferrous succinate, and 11*s.* 11*d.* for iron calcium lactate, whilst for ferrous aminoacetosulphate it is 2*s.* 8*d.*

SUMMARY

A trial is reported of the use of a chelated iron compound—ferrous aminoacetosulphate ('plesmet')—in the treatment of anæmia of pregnancy. Excellent responses of 4.5 per cent. (0.66 g.) per week were obtained in 51 patients in the first two weeks of treatment. In the 13 more anæmic patients the weekly increase was 6.5 per cent. (0.96 g.), suggesting rapid utilization of this form of iron. Gastro-intestinal disturbances occurred very rarely.

I wish to thank the consultant obstetricians of this hospital for permission to carry out the trial and Messrs. Coates and Cooper Ltd. for a supply of ferrous aminoacetosulphate ('plesmet') and ferrous gluconate tablets of identical size and colour. A pricing bureau of the Joint Pricing Committee of England kindly supplied the prices.

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TRIAL OF AN IRON CHELATE IN PÆDIATRICS

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THE importance of the administration of iron as a prophylactic measure in premature babies is well established, as is the use of iron for the treatment of hypochromic anæmia. Many iron preparations have been advocated and it is generally agreed that the best preparations are those containing iron in the ferrous form, although in some preparations, for example, iron and ammonium citrate, the iron is in the ferric form. A therapeutic comparison of the efficacy of oral iron preparations in adults (O'Sullivan, Higgins and Wilkinson, 1955) showed that with equivalent amounts of metallic iron the percentage daily rise of hæmoglobin was similar with ferrous sulphate, ferrous succinate and ferrous gluconate.

The technical difficulties and the undesirability of giving intravenous iron to young children are generally agreed and as an alternative intramuscular iron ('imferon') has been used. The daily rise in hæmoglobin in 21 children up to 27 months of age receiving 'imferon' was 1.5 per cent. (Gaisford and Jennison, 1955). Reactions may be associated with the use of intramuscular iron (Bourne, 1955) and on general grounds it is undesirable to subject children to injections if oral medication will achieve similar results.

RESULTS

This report describes our experiences with ferrous aminoacetosulphate ('plesmet'), a pleasant-looking and -tasting syrup containing 25 mg. of iron in each teaspoonful. Thirty-two patients, aged from 4 weeks to 11½ years, were given this preparation of ferrous aminoacetosulphate. In five of the patients (table I) the iron was given for prophylactic reasons; four of these were premature babies and one was a boy of 4½ years suffering from thrombocytopenic purpura. These patients readily accepted the preparation and suffered no alimentary upsets. Twenty-three patients, aged from 2 months to 5 years 9 months, who were suffering from hypochromic anæmia following infections, responded satisfactorily to treatment (table II). The average daily rise of hæmoglobin was 1 per cent. One girl (case no. 23), who was under treatment for tuberculous meningitis, took the preparation well for three weeks and then had an attack of diarrhœa and vomiting. The tuberculous process was subsiding, there was no bacteriological evidence of a gastro-intestinal infection and the symptoms ceased soon after 'plesmet' was discontinued. One boy with chronic myeloid leukæmia (case no. 29) was given prednisolone as well as 'plesmet', and the former probably contributed materially to the rise in hæmoglobin level.

Table III shows that the hæmoglobin levels of three patients remained stationary over the period of two to six weeks during which they received 'plesmet'. Each patient was suffering from an alimentary disorder associated with an absorption defect. One of them (case no. 31) had no free acid in

Case no.	Age	Primary disease	Initial Hb level	Dosage of 'plesmet' syrup	Duration of treatment (weeks)
1	4 weeks	Prematurity and respiratory infection	59% (8.8 g.)	30 ml. twice daily	6
2	5 weeks	Prematurity	85% (12.6 g.)	30 ml. thrice daily	7
3	6 weeks	Prematurity and pyloric stenosis	97% (14.4 g.)	30 ml. thrice daily	6
4	6 weeks	Prematurity	72% (10.7 g.)	30 ml. twice daily	6
5	4½ years	Thrombocytopenic purpura	94% (13.9 g.)	60 ml. thrice daily	3

TABLE I.—Details of children given 'plesmet' syrup prophylactically.

Case no.	Age	Primary disease	Initial Hb level	Dosage of 'plesmet' syrup thrice daily	Duration of treatment (weeks)	% daily rise in Hb
6	2 months	Meningococcal meningitis	54% (8 g.)	30 ml.	7	1.6
7	2¼ months	Acute bronchiolitis	75% (11.2 g.)	60 ml.	3	0.3
8	3 months	Suppurative cervical adenitis	58% (8.6 g.)	30 ml.	3	2.4
9	3 months	Pneumonia	59% (8.8 g.)	60 ml.	3	1.3
10	5 months	Subdural effusion	67% (9.9 g.)	60 ml.	4	1.0
11	7 months	Suppurative otitis media	67% (9.9 g.)	60 ml.	3	1.0
12	9 months	Meningococcal meningitis	58% (8.6 g.)	60 ml.	6	1.2
13	1 year	Meningococcal meningitis	63% (9.4 g.)	60 ml.	2	3.0
14	1 year	Pneumonia and otitis media	64% (9.5 g.)	60 ml.	3	0.5
15	1 year 1 month	Bronchitis	62% (9.2 g.)	60 ml.	3	1.0
16	1 year 2 months	*H. influenzæ* meningitis	63% (9.4 g.)	60 ml.	3	1.0
17	1 year 3 months	Bronchitis and congenital heart disease	67% (9.9 g.)	60 ml.	3	0.7
18	1 year 4 months	Respiratory infection	47% (7 g.)	60 ml.	4	0.9
19	1 year 6 months	Pneumonia	56% (8.3 g.)	60 ml.	4	1.2
20	1 year 8 months	Meningococcal meningitis	56% (8.3 g.)	60 ml.	4	1.6
21	1 year 9 months	Congenital hemiplegia	58% (8.6 g.)	30 ml.	4	1.0
22	1 year 10 months	Broncho-pneumonia	70% (10.4 g.)	60 ml.	4	0.3
23	1 year 11 months	Tuberculous meningitis	75% (11.1 g.)	60 ml.	3	1.0
24	1 year 11 months	Upper respiratory tract infection	58% (8.6 g.)	60 ml.	3	1.6
25	2 years 1 month	Acute respiratory infection	70% (10.4 g.)	60 ml.	3	0.8
26	3 years 3 months	Pneumonia	59% (8.8 g.)	60 ml.	6	0.9
27	3 years 8 months	Thrombocytopenic purpura	62% (9.2 g.)	60 ml.	2	0.75
28	5 years 9 months	Post-influenzal epistaxis	64% (9.5 g.)	120 ml.	4	0.9
29	11 years 6 months	Chronic myeloid leukæmia	61% (9.1 g.)	60 ml.	4	0.9

TABLE II.—Effect of 'plesmet' on hæmoglobin level of 24 children with hypochromic anæmia.

the gastric juice and when hydrochloric acid was given orally, in addition to 'plesmet', the hæmoglobin level rose satisfactorily.

DISCUSSION

The children tolerated this preparation well, and nausea, vomiting, diarrhœa or constipation were not observed, except in one patient (case no. 23) after treatment had been continued for three weeks. An epidemic of Sonne dysentery was occurring in the ward at the time and, although no abnormal organisms were isolated from the stools of this patient, it is possible that she was suffering from an intestinal infection. In the experience of O'Sullivan *et al.* (1955) a figure of 13 per cent. is an average one for intolerance of

Case no.	Age	Primary disease	Initial Hb level	Dosage of 'plesmet' syrup thrice daily	Duration of treatment (weeks)	% daily rise in Hb
30	10 months	Cœliac disease	64% (9.5 g.)	60 ml.	6	0
31	1 year 3 months	Gastroenteritis (*E. coli* o 119); respiratory infection	62% (9.2 g.)	60 ml.	6	0
32	2 years 7 months	Acute laryngo-tracheitis; Sonne dysentery	68% (10.1 g.)	60 ml.	2	0

TABLE III.—Details of three children in whom 'plesmet' syrup failed to affect hæmoglobin level of blood.

adult patients to ferrous sulphate; in our series this was the only patient among 32 (3.1 per cent.) in whom there was any suggestion of intolerance. One mother volunteered the statement that this preparation of iron was the only one that her child had been able to tolerate.

The rise of hæmoglobin level averaged 1 per cent. (0.15 g. per cent.) per day and this rise is similar to that found in adults by O'Sullivan *et al.* after treatment with ferrous sulphate, ferrous gluconate or ferrous succinate, but rather less than the 1.5 per cent. obtained by Gaisford and Jennison (1955) with an intramuscular iron preparation.

The cost of 'plesmet' is reasonable: a 40-ounce bottle costs the hospital 18*s*. For the average child in our series the dosage given was one teaspoonful three times daily for three weeks, and the cost was 2*d*. a day, or 3*s*. 6*d*. for the three weeks' course.

SUMMARY

Ferrous aminoacetosulphate in the form of 'plesmet' syrup has been given to 32 children for prophylactic or therapeutic purposes. This preparation was readily accepted, well tolerated, and produced an average daily rise of 1 per cent. hæmoglobin. It is an inexpensive preparation, and for the average child treatment costs twopence a day.

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AMŒBIASIS IN BRITAIN

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Amœbic dysentery and its complications can produce puzzling clinical problems in those who left the tropics many years ago as well as in those more recently returned. To illustrate this well-known truth, which can be so puzzling for the general practitioner, the following cases are reported.

CASE RECORDS

Case 1.—E. McP., an electrician, aged 36, had spent the greater part of 1940-45 in the tropics as a radio-officer in the Merchant Navy.

History.—In 1943, he had a bout of sudden fever and pain in the right lower chest, diagnosed at first as pleurisy. This was treated with sulphonamides but later by intravenous fluids and emetine injections, a diagnosis of 'amœbic abscess of liver' having been made (no aspiration). In 1945, he had an attack of diarrhœa, with several loose stools daily. This subsided without treatment; a relapse was relieved by sulphaguanidine. In 1946, six months after return to the United Kingdom, he developed pain in the right side, with fever. An x-ray of the chest and screening revealed no abnormality, and the stools were reported as 'negative', but he was given six emetine injections with relief and disappearance of the fever and the pain in the liver and chest. Although now permanently resident in the United Kingdom he continued to have two or three attacks of diarrhœa every year, especially when tired or worried. These subsided in forty-eight hours with cachets of bismuth salicylate and opium, and between attacks he felt perfectly well but had lost weight. When he attended hospital on March 3, 1957, he gave a history of more persistent loose stools—up to six daily—for three weeks. No blood or mucus was seen.

Physical examination.—A nervous wasted man. Temperature 98° F. (36.7° C.). Pulse 110 per minute. No other abnormal signs except doubtful tenderness below the right costal margin. Sigmoidoscopy revealed multiple small bleeding ulcers in the lower rectum surrounded by œdematous mucosa. Above this level the mucosa was normal. Examination of the stool and of a smear from an ulcer revealed no pathogenic organisms, but a fresh stool three days later showed motile vegetative *Entamœba histolytica*.

Treatment.—As the patient was unable to leave his work immediately, 'first-aid' treatment with 'nivembin' (a combination of chloroquine and di-iodohydroxyquinoline) was given, followed a month later by eradication of the intestinal infection by emetine bismuth iodide, 0.2 g. daily for twelve days.

This case illustrates (a) the desirability of eradicating the intestinal infection from which liver involvement arises, however successful the treatment of hepatic amœbiasis has been; (b) that the exaggeration of intestinal symptoms due to stress does not exclude an organic lesion; (c) persistence of intestinal amœbiasis for eleven years without further evident reinfection of the liver.

Case 2.—W. S. M., a coal-miner, aged 36, had been in India and Burma from 1942 to 1946.

History.—In 1943, he had an attack of diarrhœa which had been treated with ?sulphonamides. In 1946, he was demobilized, category A.1. The following year he returned to the mines, but was off work for about two weeks each year with vomiting

and anorexia. In November 1954, there was an attack of pain and tenderness in the right hypochondrium but this did not keep him off work.

He was admitted to hospital in March 1955, with a history of recurrence of the pain in the right hypochondrium for three days, for which he had been given penicillin for two days.

Physical examination.—There was a tender, slightly œdematous area in the right mid-axillary line between the 7th and 8th ribs. The temperature was 103° F. (39.3° C.), and the hæmoglobin 105 per cent. The white cell count was 17,500 per c.mm., with 83 per cent. neutrophils, 11 per cent. lymphocytes, and 6 per cent. monocytes. Cysts of *E. histolytica* were found in the second stool examined but in no subsequent stool.

Treatment.—A diagnosis of hepatic amœbiasis having been made, there was rapid response to two injections of emetine hydrochloride (50 mg., 65 mg.) followed by: chloroquine, 300 mg. base twice daily for two days, then 150 mg. base for seven days, and finally emetine bismuth iodide, 0.2 g. each evening for twelve evenings. Di-iodohydroxyquinoline and chloroquine were given during convalescence.

This case illustrates that an urgent hepatic amœbiasis may arise nine years after leaving the tropics, with a history of diarrhœa on only one occasion before leaving the tropics but with occasional bouts of vomiting subsequently.

Case 3.—P. V. S. A., a business man, aged 47, had served in the Army from 1933 to 1947.

History.—He had served in India from 1933 to 1935 and had had malaria but not dysentery. In 1940 he was transferred to Egypt, and two years later developed amœbic dysentery, for which he received ten injections of emetine, followed by a ten-day course of emetine bismuth iodide. In 1946, while in India, he developed amœbic hepatitis, and was on the 'dangerously ill' list for one month. Treatment consisted of emetine injections, penicillin, and intravenous glucose. Coffee-coloured pus was aspirated daily for two to three weeks, followed by rib resection, with further aspirations. He was in bed for 3½ months, and was then invalided home to the United Kingdom. The following year he was discharged from the Army, following a Medical Board. After this he kept well until September 9, 1957, when, during an influenza epidemic, he complained of malaise, loss of appetite, sweating and increasing weakness. The temperature remained around 101° F. (38.2° C.) and the liver became palpable and tender, and on October 9 he was admitted to hospital.

Physical examination.—He was a sick, sallow-skinned, wasted man looking much older than his age. The temperature was 101° F. (38.2° C.), the pulse 64 per minute, and the tongue dry and uncoated. The bowels had not been open for three days. There was bulging of the right lower chest, with dullness on percussion over the base of the right lung. The liver edge was not clearly defined but it was tender at a site below the right costal margin where percussion indicated probable liver enlargement. There was no tenderness of the bulging chest wall. A portable x-ray of the chest revealed a high right dome with some atelectasis at the right base. The hæmoglobin was 95 per cent., the red cell count 3,280,000 per c.mm., and the white cell count 11,800, with 82 per cent. neutrophils, 14 per cent. lymphocytes, 4 per cent. monocytes, and 2 per cent. eosinophils. No malarial parasites were seen. A diagnosis of probable hepatic amœbiasis was made.

Treatment.—Chloroquine, 300 mg. base, followed by 300 mg. four hours later; then 300 mg. twice daily for two days, then 150 mg. twice daily for fourteen days. This was followed by a 12-day course of emetine bismuth iodide. There was a rapid response to treatment. The patient became afebrile in two days and he made an uninterrupted recovery. Stools examined up to October 28 contained *E. histolytica* but thereafter no cysts were found.

This case was unusual in that the patient had a severe illness due to hepatic amœbiasis after a 10-year symptom-free period following a rib

resection for an amœbic abscess of liver. It illustrates the desirability of repeated stool examinations and the elimination of an apparently symptomless persistent intestinal infection if due to a pathogenic amœba.

Case 4.—J. B., a long-distance bus driver, aged 35, had not been in the tropics for nine years.

History.—While in the Army he had spent the period, January 1943 to April 1946, in India and Burma. The only feature of note in his medical history was an illness characterized by night sweats in October 1943. This was not accompanied by pain, but he was x-rayed and a diagnosis made of pleurisy (left). He was given sulphonamides for ten days, and was off duty for three weeks. In September 1946, his chest was x-rayed and he was demobilized, category A.1. There was no history of diarrhœa; the only loose motions were after an occasional aperient for constipation.

In August 1955, he developed an illness diagnosed as left basal pneumonia without radiological confirmation. Treatment consisted of tetracycline. He was febrile for a week, and was kept in bed for five weeks, following which a chest x-ray was taken. This was normal. He was off work until October 1955, and then returned to full work but never felt really well. On November 17, 1955, he complained of pain in the right shoulder, and attended a hospital as an outpatient. His right shoulder and chest were x-rayed, and arrangements were made for physiotherapy for the shoulder. The next day he developed a cough, with increasing amounts of sputum, and pain in the right upper chest, and on November 20 he came under our care.

Physical examination.—He had well-marked signs of a right pleural effusion, and, on aspiration the following day, 500 ml. of thick chocolate-coloured pus was withdrawn which was sterile on culture and contained no *E. histolytica*. The hæmoglobin was 82 per cent., and the white cell count 11,250.

Treatment.—He was given emetine hydrochloride, 65 mg. daily for nine days, followed by chloroquine for sixteen days. On January 9, he was started on a standard course of emetine bismuth iodide, to eradicate presumed chronic hidden intestinal amœbiasis.

The stools remained 'negative' throughout his stay in hospital. Following a second aspiration on November 23 he made an uninterrupted recovery, gained 14 lb. (6 kg.) in weight, and has kept well subsequently.

This case illustrates the difficulty in suspecting or proving the presence of cryptic amœbiasis, although it was the only likely explanation for the sudden rupture of a sterile abscess from the liver into the pleural cavity.

Case 5.—J. M. H., a fitter, aged 45, returned from Ghana by air on September 3, 1957, having been in good health during his twelve months' residence abroad.

History.—On September 15, he had an abrupt attack of diarrhœa, which subsided in a few days. Eight days later he complained of abdominal discomfort, shivering, and recurrence of diarrhœa with streaks of blood in the stools. By October 27 the diarrhœa was less, but he was vomiting daily, and on November 1 he was admitted to hospital.

Physical examination.—There was umbilical and epigastric discomfort (not pain). The liver was neither palpable nor tender. There was advanced dental caries with pyorrhœa.

The patient was dehydrated, with a dry, furred tongue. The temperature was 103° F. (39.3° C.), the pulse 130 per minute. The stool, partly formed, did not contain macroscopic blood, exudate suggestive of bacillary dysentery, amœba, cysts, or ova. The benzidine test was strongly positive. The urine contained albumin (+) and urobilinogen (++), and chlorides were present. The hæmoglobin was 95 per cent., the red cell count 4,300 per c.mm., and the white cell count 22,300 per c.mm., with 82 per cent. neutrophils, 16 per cent. lymphocytes, 2 per cent. monocytes, and 5 per cent. eosinophils. Blood culture was sterile.

Course and treatment.—November 2, 1957. The fever and vomiting continued. He complained of a 'dead feeling' in the central abdomen, with epigastric pain only

on deep inspiration. There was tenderness below the xiphisternum to the right of the mid-line, but no pain on percussion over the liver. On the hypothesis of a secondarily infected amœbic abscess of the liver, he was given aqueous procaine penicillin, 900,000 units daily, and chloroquine sulphate, 200 mg. base intramuscularly, followed by further chloroquine by mouth and, when vomiting, intramuscularly.

November 3. His condition was unchanged. Intramuscular chloramphenicol was substituted for penicillin, and chloroquine was continued.

November 4. The pain was more definite and localized to the right of the mid-line, accompanied by tenderness and rigidity. A portable x-ray of the chest revealed no definite lesion. Chloramphenicol was continued, and fluids were given intravenously.

November 6. A palpable mass, moving a little on respiration, was detected in the epigastrium. Exploration revealed an abscess, the size of a small lemon, in the right lobe of the liver, containing yellow pus. The remainder of the liver appeared normal. A drainage tube was inserted, and a biopsy specimen obtained from the edge of the abscess. Culture of the pus was sterile. Histological examination of the biopsy specimen revealed amorphous debris surrounded by granulation tissue in the liver parenchyma. Red-staining bodies were seen in sections stained by the PAS method. No recognizable amœbæ were seen. Culture (aerobic and anaerobic) was sterile. The administration of chloroquine, 300 mg. base daily, was continued, followed by a standard course of emetine bismuth iodide for twelve nights to eradicate the hypothetical intestinal infection. A barium meal revealed no abnormality, and the stools remained consistently free from ova and cysts. The patient made an uninterrupted recovery.

It is presumed that the abscess was amœbic in origin and that the colour of the pus and the leucocytosis pointed to secondary pyogenic infection (? from the teeth). The absence of amœbæ in the wall of the abscess and lack of bacterial growth are attributed to the preoperative chloroquine and chloramphenicol, respectively.

SUMMARY

Details are given of five cases of amœbic dysentery and its complications occurring in patients in the United Kingdom—in four long after return from the tropics.

Case 1.—Active intestinal amœbiasis twelve years after leaving the tropics, and eleven and fourteen years, respectively, after two attacks of hepatic amœbiasis.

Case 2.—Acute hepatic amœbiasis nine years after leaving the tropics, with a previous history of diarrhœa only.

Case 3.—Acute hepatic amœbiasis ten years after leaving the tropics where amœbic dysentery and a hepatic abscess had occurred.

Case 4.—Amœbic abscess of liver rupturing into the pleural cavity nine years after leaving the tropics, with no history of diarrhœa.

Case 5.—Pyogenic abscess of liver (probably due to secondary infection of an amœbic abscess) without early localizing signs, after a year in the tropics without any diarrhœa.

SECTION OF GENERAL PRACTICE OF THE

ROYAL SOCIETY OF MEDICINE

DO'S AND DON'TS IN DENTAL DOPES

PRESIDENT'S ADDRESS (*Abstract*)

By MICHAEL KERR, M.B., B.S., F.F.A.R.C.S., D.A.

October 15, 1958

The subject is reviewed in the logical sequence of preparation, induction, surgical anæsthesia, and recovery.

PREPARATION

Careful attention to details in arranging the appointment, discussing unusual features of any case and giving instructions to the patient is worth emphasis. A strict fast from the previous evening and a judicious use of premedication are advocated.

Arrive early to check the apparatus, including cylinders for their connexions, content and that of the reserve supply. Distrust labels and pressure gauges. Arrange the setting, dim the lights and *collect yourself quietly*. Then admit the patient. Consider the routine formalities before seating the patient in the chair. The position in the chair must be relaxed; multiflexion is the best general rule. A strained position will retard induction. Insertion of the prop is the final step; the correct choice of size and position is as difficult as it is important.

From this moment *silence is golden and must be absolute* until signified by the anæsthetist. Anyone who fails to enlist the cooperation of the dental surgeon or his staff in this respect fully deserves the consequences.

INDUCTION

In starting the flow of nitrous oxide, take great care to avoid an explosive rush of gas which will have equally explosive reactions on the patient. A moderate pressure of 5 to 10 mm. is usually sufficient. Nasal breathing is best obtained by asking the patient to breathe *out* through his nose. Delay full contact with the nosepiece until analgesia is attained. Mouth-breathing is most commonly due to nervousness and can often be countered by persuasion. If a mouthpiece is found necessary, it *must* be provided with an independent supply of nitrous oxide to avoid the feeling of suffocation otherwise inevitable. After nasal breathing is established, ask the patient to

close his eyes as for normal sleep. The final position of the nosepiece must be maintained by pressure from above downwards to counteract the upward drag of the tubing.

SURGICAL ANÆSTHESIA

Automatic respiration gives a characteristic and dramatic indication of the onset of this stage; eye signs are unreliable and not without risk. Nasal breathing, an invariable accompaniment, is more useful as a sign of lightening anæsthesia.

The onset of automatic respiration is the signal for an immediate addition of oxygen, about 8 per cent. being the average requirement in the normal subject. Any alteration to the mixture will not become apparent clinically for three to four breaths—an interval of ten to twelve seconds; failure to await this is the commonest cause of 'swinging anæsthesia'.

After stabilization, the Silence Barrier is removed and the mouth is packed; 2 to 3 feet (60 to 90 cm.) of 4-inch (10-cm.) gauze roll with one-third outside the mouth is the safest. Proper positioning is of vital importance.

Extractions may now start and the anæsthetist may help in the following way. Position the head and mandible as required; give counterpressure on the top of the head or below the mandible; assist in transfer of the prop; swab and check clearance of the mouth; safeguard from trauma the patient's lips and eyes, the surgeon's and even one's own fingers from being bitten! Meantime, there must be undistracted attention to the patient's colour, respirations and pulse.

After the extractions, with bleeding controlled and the state of the mouth checked, remove the pack.

RECOVERY

This stage is best regarded as the stage of induction in reverse, remembering magnification of sound and delirium. Pure oxygen is unnecessary and may reduce the blood pressure. Avoid noise as during induction and position the head to promote drainage from the mouth by maintaining a free airway.

Postpone the mouthwash until the patient is fully capable and removal from the chair until return of coordination.

SUMMARY

The following requisites are suggested to give dental dopes with uniform success:—

(1) A sound knowledge and a very healthy respect for this major accompaniment of minor surgery.
(2) Full cooperation and teamwork with the dental surgeon and his staff.
(3) Judicious premedication.
(4) Unhurried and assiduous preparations.
(5) Anticipating and assessing mixture alterations.
(6) Four pairs of hands, four pairs of eyes and four pairs of ears!

CURRENT THERAPEUTICS

CXXXII.—TRIIODOTHYRONINE

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A short while ago the thyroid seemed to be a relatively simple gland. Now this is a wistful memory thanks largely to the introduction of chromatography and autoradiography using radioactive iodine. Chromatography allows the separation of iodinated amino-acids which can be identified in

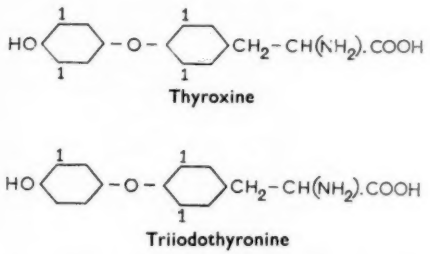

Fig. 1.—Chemical structure of thyroxine and triiodothyronine.

minute quantities by autoradiography. During early work with these techniques a hitherto undiscovered iodinated compound was found under certain conditions in the sera of rats and humans (Gross and Leblond, 1951; Gross and Pitt-Rivers, 1951). This compound was finally isolated and identified as triiodothyronine by Gross and Pitt-Rivers in 1952. In the same year Roche and his colleagues identified the compound in hydrolysates of thyroglobulin. Triiodothyronine ceased to be a chemical curiosity when it was found to have five times the potency of thyroxine in the rat goitre-prevention test (Gross and Pitt-Rivers, 1952b). Its clinical possibilities were demonstrated by its remarkable power in the treatment of myxœdema (Gross, Pitt-Rivers and Trotter, 1952).

MODE OF ACTION

The structure of triiodothyronine differs from that of thyroxine in the absence of one iodine atom (fig. 1). Its biological activity resides almost entirely in the lævorotatory isomer. Over a very wide range of physiological tests no qualitative difference in action has been noted between triiodo-

thyronine and thyroxine or, for that matter, thyroid extract. All these substances have the same effect on all aspects of myxœdema (Asper *et al.*, 1953; Crispell *et al.*, 1957) and on the iodine uptake of the normal thyroid (Starr and Liebhold-Schueck, 1953). Laboratory workers have recorded the similarity of their actions on the rat goitre-prevention test, metamorphosis of tadpoles, galactopoiesis in cows, and even on the time of eye-opening in new-born rats. From the practical standpoint triiodothyronine is distinguished by its potency and extremely rapid action. Its effects on hypothyroidism are discernible within a few hours and obvious in two days; cessation of treatment is followed by a rapid and unpleasant return to the myxœdematous state (Frawley *et al.*, 1956).

Mystery still surrounds the exact physiological role of triiodothyronine. A most attractive theory held that thyroxine was a precursor of triiodothyronine, the latter being the active component of the thyroid hormone formed by deiodination of thyroxine at its site of action. This would account for the slowness with which thyroxine appears to act, the time lag being due to its conversion to triiodothyronine. Conversion of thyroxine to triiodothyronine has been demonstrated in totally thyroidectomized man (Pitt-Rivers, Stanbury and Rapp, 1955) and in various cell homogenates (Maclagan and Sprott, 1954). Roche and Michel (1954) could not demonstrate this reaction, however, and put forward evidence to show that triiodothyronine was actually formed by, and released from, the thyroid. The early appearance of triiodothyronine in the serum of patients after treatment with radioactive iodine certainly suggests a thyroid origin for this hormone (Benua *et al.*, 1955). It is now no longer held that triiodothyronine is the sole active component of thyroid hormone with thyroxine as only a precursor. The gland secretes two hormones of different potency and speed of action; the reason for this is a matter of speculation.

INDICATIONS

Any clinical application of triiodothyronine depends only upon the desirability of its rapid effect, because its action is qualitatively the same as thyroxine or thyroid extract. In hypothyroidism 0.02 mg. of triiodothyronine is as potent as 0.1 mg. of l-thyroxine or 1 grain (60 mg.) of thyroid extract B.P. This produces no economic advantage because for every pound spent on thyroid extract £5 16*s.* would be spent for a therapeutically equivalent dose of thyroxine and £16 2*s.* for triiodothyronine.

Myxœdema provides the most common indication for treatment with thyroid hormone. Here, initial treatment should be gradual, as a rapid rise in metabolic rate might endanger a myxœdematous heart. A steady life-long maintenance treatment should not allow a sudden resumption of the disease if the forgetful patient omits her tablets for a day or so. The rapid and transient action of triiodothyronine precludes its use in the routine treatment of myxœdema which is eminently successful with thyroid extract or thyroxine.

COMPLICATIONS OF MYXŒDEMA

Rapid alleviation of myxœdema is demanded in certain circumstances. *Myxœdematous madness* may present as an acute psychotic episode with violent mania. Clearly triiodothyronine is preferable to other forms of thyroid hormone in this condition. An oral dose of 0.02 mg. repeated every eight or twelve hours is advisable. There seems to be no real advantage in employing the intravenous route, by which a repeated dose of 0.01 mg. would be sufficient. Any setback from the initial improvement or the appearance of angina must be countered by lowering the dose.

A useful but restricted application of triiodothyronine lies in the treatment of *hypothyroidism* in patients with carcinoma of the thyroid who have to receive repeated doses of radioactive iodine (Goolden, 1957). As hormone treatment has to be stopped before each dose the unpleasant period of hypothyroidism can be kept short with the rapid disappearance of triiodothyronine after withdrawal, whilst thyroid extract or thyroxine must be stopped four weeks before radioactive iodine administration and will require at least two weeks after resumption of treatment before the patient feels better.

Zondek and his colleagues (1955) commented on the dramatic alleviation of juvenile myxœdema by triiodothyronine. Young patients, in my experience, do appear to show a more rapid clinical response than adults with myxœdema. As early diagnosis and treatment is of paramount importance in *cretinism*, there seems to be a good argument for the routine use of triiodothyronine in the initial treatment of this disease. Maintenance therapy should be with thyroid extract or thyroxine, provided the change in treatment is not accomplished by suddenly withdrawing triiodothyronine. Simultaneous administration of both the quick- and slow-acting thyroid hormones is necessary while triiodothyronine is gradually withdrawn over a period of ten days. This will prevent a transient relapse to hypothyroidism.

The most serious and almost invariably fatal complication of myxœdema is *coma*. Indeed, it is a preterminal stage of the disease in which the metabolic rate falls so low that body temperature cannot be maintained. Treatment by gentle heating and intravenous hydrocortisone has its place; but thyroxine is too slow in action to be of use. In theory the rapid action of triiodothyronine makes it the hormone of choice but there are insufficient data recorded to establish an optimum dosage or to distinguish its effects from other forms of treatment applied at the same time. Dyson and Wood (1956) reported improvement after a single intravenous dose of 1.2 mg., but this seems a dangerously large amount to advocate for future use. Administration by intragastric tube is probably preferable to the intravenous route. Surtees and Ginsberg (1958) gave an initial dose of 0.1 mg. into the stomach, followed by repeated doses to a total of 0.04 mg. daily. Their patient made a complete recovery from her comatose state, undoubtedly due to the administration of triiodothyronine, but died three weeks later from a coronary thrombosis. Using a similar form of treatment I have

cured the coma of a myxœdematous patient only to have her die of heart failure two weeks later. Undoubtedly, triiodothyronine should be used in every case of myxœdematous coma provided the initial dose does not exceed 0.1 mg. and the subsequent daily dose 0.04 mg. Its immediate benefits should not blind one to the fact that the patient is likely to have such irreversible cardiac damage that death is delayed but not prevented. At all times the induced rise in metabolic rate has to be carefully assessed against its dangers to the heart.

OTHER THYROID DISORDERS

Exophthalmic ophthalmoplegia and its occasional bizarre accompaniment, *pretibial myxœdema*, have successfully resisted a wide range of hormonal treatments. Some recession of exophthalmos can be accomplished with triiodothyronine or thyroxine but there is no difference between the rather disappointing effects of either hormone (McCullagh *et al.*, 1957). Pretibial myxœdema is not influenced by triiodothyronine either systemically or locally, although the hormone enters the myxœdematous area as easily as normal skin (Greer, 1957).

Diagnostic tests in *thyrotoxicosis* now include the observation of thyroid concentration of radioactive iodine after administration of thyroid hormone which suppresses the iodine uptake of the normal thyroid. It has been claimed that no suppression occurs in thyrotoxicosis. The practical value of such a test is not fully evaluated but the method is of considerable importance to research. Triiodothyronine is the hormone most suitable for the technique because of its rapid transient action and great potency (Werner and Spooner, 1955; Perlmutter and Slater, 1955).

DISORDERS NOT INVOLVING THE THYROID

Tradition, not science, has hallowed the use of thyroid extract in *obesity* associated with normal thyroid function. A sustained rise in metabolic rate cannot be attained unless the amount of thyroid extract exceeds the normal endogenous supply of thyroid hormone because the thyroid extract suppresses normal thyroid activity at the same time as it exerts its calorigenic effect. The weight-reducing potential of an artificially raised metabolic rate is often neutralized by an increase in the patient's food intake. In these circumstances, triiodothyronine offers neither more nor less than thyroid extract.

A *lowered metabolic rate* in the absence of thyroid disorder may be due to malnutrition or endogenous depression, apart from spuriously low measurements due to faulty technique or the limitations of the height/weight formula for calculation. In the absence of all such factors a low metabolic rate has been attributed to metabolic insufficiency, a state alleged to cause a host of symptoms varying from apathy to debility. It has also been claimed that this state is cured by triiodothyronine but is uninfluenced by thyroxine (Kurland *et al.*, 1955; Tittle, 1956). This was an interesting suggestion

when it was considered that the former was the sole active component of thyroid hormone but this thesis is no longer tenable. Metabolic insufficiency, a particularly inept term, has yet to be proven as a clinical entity with a specific sensitivity to triiodothyronine. Moreover, the diagnosis cannot be postulated unless both thyroid function and metabolic rate have been determined accurately. The alleged symptoms of physical and mental sluggishness, irritability and depression are far from specific and cannot in themselves be an indication for the use of triiodothyronine. As a leading article in the *Lancet* (1956) commented, 'most patients attending doctors' surgeries (including nearly all who need a "tonic") have one or more of the symptoms attributed to "non-myxœdematous hypometabolism" '. It would be a pity if triiodothyronine, a hormone of great physiological interest and genuine but restricted usefulness, were squandered lavishly on inappropriate conditions.

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MINOR SURGICAL PROCEDURES

XII.—DENTAL SURGERY

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THE general practitioner may be asked to treat various dental conditions. According to the facilities available cases may present for either simple complete treatment—principally the extraction of teeth—or for emergency measures with later reference to the appropriate dental practitioner. The basic principles of treatment are, of course, the same as those for general medical conditions but differ in the methods and materials used.

As pain is the most common presenting symptom this subject will be dealt with first and in some detail. Examination of the mouth will determine whether or not caries is present on the affected side.

THE DIAGNOSIS AND TREATMENT OF DENTAL PAIN

Toothache with caries.—Pain from a decaying tooth follows a well-defined pattern. From a careful history one can determine with accuracy the pathological condition of the tooth.

Initially, and with a comparatively shallow cavity, the pain is spasmodic, of short duration and usually associated with eating. Hot, cold and sweet foodstuffs may aggravate the symptom. At this stage it may be possible to cure the pain and save the tooth by carefully removing the soft decayed dentine, drying the cavity and inserting a temporary filling of zinc oxide mixed with oil of cloves. Without treatment the pain becomes severe, persistent and throbbing, increased when the head is lowered and relieved by cold. The pain may be referred to the opposing jaw on the same side. At this stage the tooth pulp is deeply infected and an alveolar abscess either present or imminent. A similar pain arises from an infected tooth socket and from osteomyelitis of the jaw. Satisfactory symptomatic relief may be obtained with aspirin, compound tablets of acetylsalicylic acid B.P.C., or compound tablets of codeine B.P., but as explained later the tooth will have to be extracted in due course.

The pain from an infected tooth socket is often described as being like toothache. That from surrounding soft-tissue infection is sharper and may be associated with swelling and trismus. The infected socket can be treated with prolonged sodium hypochlorite mouthwashes after syringing the socket free from food debris. If the pain is very severe the socket may be closed with an obtundent zinc oxide and clove oil dressing. In the presence of soft-tissue infection with toxic manifestations the patient may also be given penicillin or a penicillin and streptomycin mixture.

Toothache without caries.—There are many causes of this condition.

Maxillary sinusitis can simulate toothache in the upper posterior teeth. Erupting and, particularly, impacted teeth may cause a mild toothache which is self-limiting to a day or two and relieved by aspirin mixtures. An overfilled tooth with a premature contact gives rise to acute pain and tenderness to percussion which can only be relieved by cutting the filling down to the natural crown morphology. A large metal or unlined restoration may continue to give pain for years and the diagnosis of these cases is particularly difficult on account of the bizarre nature of the symptoms.

Tooth pains must be differentiated from the pre-eruptive phase of herpes zoster, trigeminal neuralgia, iritis and glaucoma.

Pain in the gums.—This symptom is almost pathognomonic of acute ulcerative gingivitis and is associated with septicæmia, fœtor oris, local lymphatic enlargement and a foul mouth with ulcerated gums and frank bleeding. The initial stages are relieved by local and careful daily application of 10 per cent. chromic acid immediately reduced with hydrogen peroxide, or continuous oral medication with antibiotic lozenges for not more than three days. Later, scaling, instruction in oral hygiene and other measures are essential if recurrence is to be avoided.

TREATMENT OF MOBILE TEETH

Mobility results from infection and destruction of the supporting tissues, principally by parodontal disease commonly known as pyorrhœa. This disease may affect a few or all of the teeth and is characterized by loss of the bony support with destruction of the periodontal fibres causing pocket formation and areas of stagnation. Once the teeth have become mobile it is seldom possible to stop the progress of the disease, but if vigorous methods are used to check it in the earlier stages it is possible to maintain the mouth in a healthy functional condition for many years. This involves entirely local measures: regular scaling, selective grinding of outstanding teeth, instruction in oral hygiene and gum massage, as well as various surgical measures which are best undertaken by a dental surgeon.

ACUTE ALVEOLAR ABSCESS

The classical picture of a 'fat face' from swelling following tooth pain results from acute infection superimposed on chronic infection around the root of a dead tooth. It must be differentiated from mumps and other parotid conditions as well as tonsillitis with lymphadenopathy, submandibular calculi, boils with submandibular adenitis, maxillary sinusitis, erysipelas of the face and angioneurotic œdema. Since pus is present it should be drained and this is best done by extraction of the tooth. Antibiotic therapy is indicated preoperatively to control septicæmia and postoperatively when adequate drainage is not obtained. If the abscess points in the buccal sulcus this region should be incised. Such a condition can be encouraged to point by the prolonged and frequent use of a hot saline mouthwash: a level teaspoonful of salt in half-a-pint (285 ml.) of water. External poulticing

should never be used unless a fluctuant area is present on the skin or when a chronic indurated and superficial swelling fails to resolve with the measures already outlined. Very rarely, when such a condition arises from an abscess on the side of the tooth root, the tooth remains vital after incision and antibiotic therapy. In these cases it may be possible to save the tooth by careful local treatment. In all other cases, when the dead pulp must be considered as an area of focal sepsis, the tooth should be extracted.

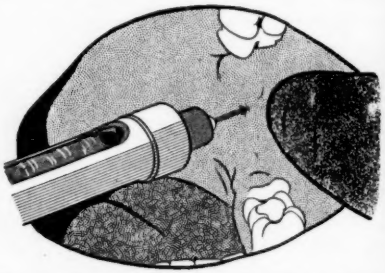

FIG. 1.—Needle and syringe in place for an inferior dental nerve block.

External swelling with trismus.—This condition usually arises as a result of pericoronitis of an erupting impacted lower wisdom tooth. As the apex is not affected the condition is usually curable with antibiotics and hot saline mouthwashes, but the inflammation will tend to recur until the tooth erupts into a normal position. Since this rarely happens it is usually wise to have the tooth extracted when the septicæmia and, if possible, the local inflammation have subsided. An immediate improvement can often be obtained by extracting the upper wisdom tooth, since the presence of the upper tooth often aggravates the condition by traumatizing the swollen soft tissue.

LOCAL ANÆSTHESIA FOR DENTAL EXTRACTIONS

Lignocaine hydrochloride is recommended for use in the mouth. The greater depth of anæsthesia obtained and the wider penetration compared with procaine far outweigh its theoretically greater toxicity. Systemic side-effects and local irritation have not been reported any more often than with procaine. A 2 per cent. solution with 1:80,000 adrenaline is supplied in cartridges for use in a dental syringe but the same solution can be used in a standard 2-ml. syringe. The dental needle is 42 mm. long and 22 standard wire gauge (s.w.g.). With the exception of the lower molars and premolars all teeth in the mouth can be anæsthetized by a simple infiltration of the soft tissues: up to 0.5 ml. on either side of the tooth. In order to anæsthetize the lower posterior teeth an inferior dental block is also necessary.

The diagram (fig. 1) shows the needle and syringe in position for an inferior dental nerve block. The needle point is in the region of the mandibular foramen. With the left index finger deflecting the cheek and with the mouth wide open the needle pierces the retromolar tissues at the point shown. The syringe barrel should pass over the opposite premolar region. When correctly inserted the needle should pass through 2.5 cm. of tissue before striking bone. When the bone is felt, withdraw the syringe a little and

slowly inject 1.5 ml. of solution. When correctly given this injection will cause anæsthesia of the lower lip within five minutes.

GENERAL ANÆSTHESIA

When extracting teeth under general anæsthesia a gauze swab should be used to occlude the oro-pharyngeal isthmus. The reasons for this are to promote nose-breathing and stop blood or tooth fragments passing into the

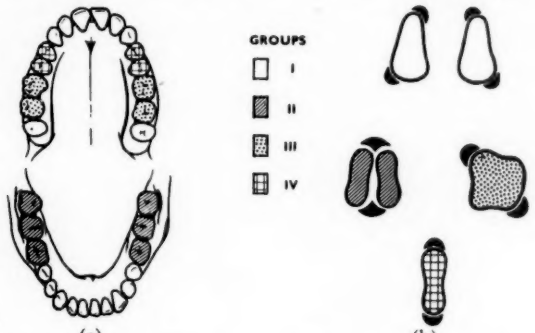

FIG. 2.—(a) The teeth grouped according to their root morphology. (b) Position of forceps beaks on the roots of the teeth.

pharynx. This throat pack should extend back and forth from one retromolar fossa to the other and close the isthmus loosely without obstructing the airway.

A satisfactory pack can be made from two feet (61 cm.) of six-inch (15 cm.) double gauze folded twice lengthwise. The pack extends outside the mouth and also provides a convenient means of controlling hæmorrhage.

EXTRACTION OF ADULT TEETH

Before extraction of any tooth the periodontal membrane must be ruptured and the bony socket dilated. The former attaches the tooth to bone and the latter holds the tooth in place by virtue of its shape. An inexperienced extractor should have the complete set of five well-designed extraction forceps: i.e. one each for upper-anterior, premolar and molar teeth; one for lower-anterior and premolar teeth and one for lower molars.

The forceps blades are applied to the neck of the tooth and forced between the tooth and the alveolar bone, care being taken not to injure the mucous membrane. Balanced force is then applied through the blades along the central axis of the tooth in order to dislodge it from the socket. At the same time a routine sequence of movements is used to dilate the socket. These important movements are divided into four groups according to the root morphology of the teeth (fig. 2a).

For each group there is also an individual way of applying the forceps. The simple principle involved is that each tooth is gripped across its greatest transverse axis (fig. 2b).

Lower right-posterior teeth should be extracted from above and behind the patient. All other teeth are extracted more easily when the operator stands in front of the patient. This assumes that he uses his right hand. An even distribution of thrust at the end of the forceps blades is essential and is achieved by a special grip. Equal force is applied through the palm of the hand along one blade and the ball of the thumb along the other. In addition the grip provides complete control of pressure (fig. 3a, b). During the operation the left hand supports the bone around the tooth, deflects the lips and tongue and during extraction of lower teeth supports the lower jaw.

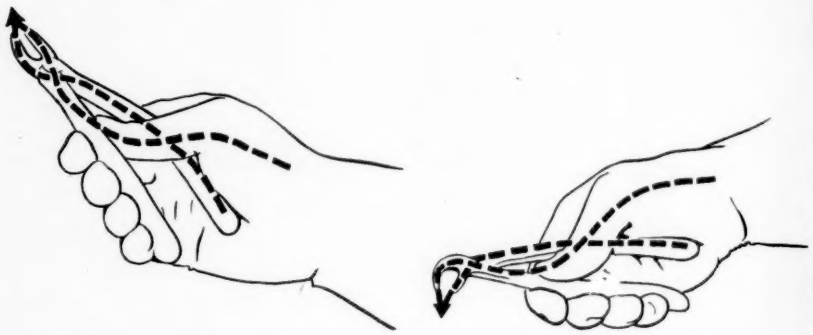

FIG. 3a, b.—Grip of forceps for upper and lower teeth.

Movements of extraction: Group I (as indicated in the diagram fig. 2a).—The teeth in this group have a conical root form, and are the simplest teeth to extract. The dilating movements of rotation combined with force towards the root apex can be increased by consecutive use of the two gripping positions shown (fig. 2b, top). It will then be possible to expel the tooth from its socket by an extraction force combined with mesial rotation to dislodge the distally inclined apex (fig. 4).

Group II.—The over-all form of two-rooted teeth is also conical but more force is required for their extraction because of the greater surface area of periodontal membrane. The initial rotatory movements of dilation should be combined with buccal and lingual inclination. This is done by lifting the forceps handles as they are brought forwards and dropping them as they are taken backwards. During these first movements, as always, apical pressure is exerted to rupture the periodontal fibres.

If possible the movement of extraction should be a rotation towards the midline bringing the hand up towards the operator's face, thus expelling the tooth towards the tongue (fig. 5). This avoids fracture of the thinner buccal plate with later sequestration and irregular ridge formation.

Group III.—Three-rooted teeth are held in place principally by the wide spread of their smaller roots. The first movement must be towards the midline combined with considerable apical pressure. This throws the greatest strain on the stronger palatal root. Once a small movement has been obtained, and continuing the apical pressure, the tooth should be moved over to the buccal side. The same movements, now combined with extraction force, enable the operator to dislodge the tooth from its socket by a series of steps thus leaving the alveolar bone in place (fig. 6). Immediately following all extractions the socket lips can be approximated by digital pressure before asking the patient to bite on a gauze square.

Group IV.—These teeth have one or two irregular and delicately formed roots. They are best removed by a series of small and steadily increasing movements of dilatation in the manner used to remove a pole from the ground. If all the early movements are combined with apical pressure the incidence of fractured roots will be lessened. Once the socket is sufficiently dilated the tooth can be easily expelled with a downward pull (fig. 7).

TREATMENT OF RETAINED ROOT FRAGMENTS

Fractured tooth roots should be removed if possible. If an apex has to be left in its socket in the presence of infection the patient should be given a

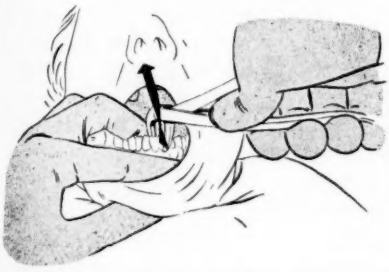

FIG. 4.—Movements of extraction for teeth in group I.

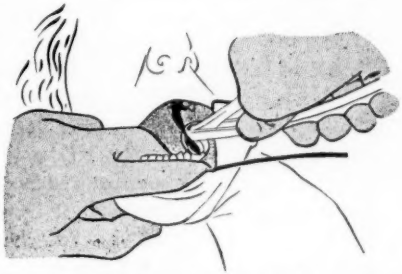

FIG. 5.—Movements of extraction for teeth in group II.

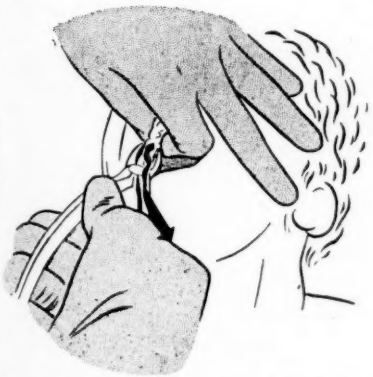

FIG. 6.—Movements of extraction for teeth in group III.

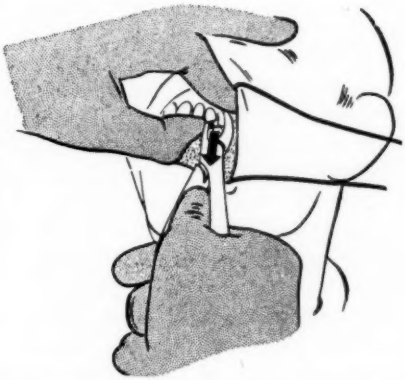

FIG. 7.—Movements of extraction for teeth in group IV.

full course of an antibiotic which will work in the presence of pus. This usually allows it to become enclosed in healthy blood clot and later bone.

As the retained fragment constitutes a possible area of focal sepsis, these patients should always be referred to a dental surgeon if possible.

ARREST OF POST-EXTRACTION HÆMORRHAGE

Primary.—The bleeding following extraction under general anæsthesia will usually cease spontaneously. Immediately the patient returns to con-

sciousness he should be instructed to wash out the mouth and then to spit out any blood until the initial clot formation occurs. No further fluid intake should be allowed for two hours.

Following extraction under local anæsthesia, and without allowing saliva to contaminate the forming blood clot, pressure must be applied. After squeezing the socket walls a gauze square is placed so as to approximate the socket lips and the patient instructed to bite on this for five minutes.

Intermediate.—98 per cent. of bleeding sockets are due to a local cause—usually injured blood vessels in the surrounding soft tissue. An attempt should be made to control the bleeding in the manner already described. If this pressure fails the mouth should be cleaned and an effort made to locate the bleeding vessel. A blunt instrument pressed in different positions around the socket will commonly control the flow, in which case a suture should be placed in the region indicated. Capillary oozing from the gingivæ may be controlled by a mattress suture across the socket.

In addition to these measures a composition block may be made to fit and press on the area. This is done by inserting a warmed ball of dental composition or, if this is not available, a piece of wax candle over the socket and asking the patient to bite. The composition takes a few minutes to set and during this time may be moulded to fit the surrounding tissues comfortably. The appliance can be taken out and replaced by the patient but should be worn continuously for the first two hours and retained by a head-to-chin bandage.

It is always undesirable and seldom necessary to combine such treatment with local application of vasoconstrictors, hæmostatics or styptics. In the rare cases of blood diseases causing hæmorrhage, a 2 per cent. thrombin spray has been found the most effective local application combined with the composition block. If neither sutures nor dental composition are available it is often possible to control the hæmorrhage with gauze soaked in 1:1000 adrenaline or dusted with tannic-acid powder. One disadvantage of this method is the increased incidence of infected sockets with resulting pain and later poor ridge formation.

Secondary hæmorrhage should always be treated by suture of the infected vessel and administration of antibiotics. Later, whole blood transfusion or hæmopoietic therapy may be required.

FRACTURES AND DISLOCATIONS OF FRONT TEETH

No permanent deformity arises following loss of deciduous front teeth. The immediate dangers of trauma are inhalation of tooth particles and pain from the exposed dental pulp. Loose particles should be removed and if the dental pulp is exposed the tooth should be extracted. The more common condition of subluxation without fracture only requires symptomatic treatment. Trauma to adult teeth usually causes either fracture or dislocation.

Fracture.—If the fracture line has passed through the enamel without involving dentine, treatment is required for æsthetic reasons only and is

best deferred until after the age of eighteen. If the fracture affects the dentine without involving the pulp, and the dentine is, or becomes, sensitive to external stimuli it must be protected. A zinc oxide and clove oil dressing is placed over the exposed dentine and kept in place by any suitable appliance. As a temporary appliance an aluminium milk-bottle top or a portion of a toothpaste tube can be moulded over the tooth crown. The dressing must be left in place until the stimuli no longer cause pain; usually for several months.

When the fracture has exposed the dental pulp it is only possible to save the tooth by immediate root canal therapy. Such cases should be referred to a dental surgeon at once. If such a service is not available within twenty-four hours, antibiotic cover should be given until the tooth is treated or extracted.

Dislocation.—Dislocation of permanent front teeth is more common in patients under the age of nine. If this occurs it may be possible to save the tooth by replacing it in correct position manually and fixation with inter-dental wiring or splints made with the materials already suggested. Dislocations without fracture occurring in patients above the age of nine years can be treated in the same way but in addition root canal therapy is essential. In both cases prophylactic antibiotic cover should be given. Fixation should be maintained for at least six weeks before testing for mobility.

EARLY TREATMENT OF FRACTURES OF THE JAW

In the presence of an adequate dentition any displacement resulting from fractures of the jaws will be indicated by deviation from normal occlusion. In the same way the degree of reduction can be estimated.

As well as treatment of the patient's general condition an effort should be made to reduce and fix the fragments in the position of normal occlusion. At the same time it is of primary importance to ensure an adequate airway, bearing in mind the possibility of later swelling of the tongue and floor of the mouth. The jaws may be immobilized by bandages and chin supports with any dentures in place or by intermaxillary wiring when most of the teeth are present. Wiring is done with 25 and 28 s.w.g. soft stainless-steel wire in such a manner that the jaws can be rapidly freed in case of emergency.

The treatment of maxillo-facial injuries is a highly specialized branch of surgery and should not normally be undertaken by anyone but an expert.

REDUCTION OF A DISLOCATED MANDIBLE

The dislocated mandible is fixed in a fully open position. It can be reduced by prolonged down and backward pressure with the operator's thumbs in the molar region, whilst the other fingers gently close the jaws by pressure under the chin.

I should like to thank my friend and colleague Mr. Gordon Ashcroft for his help and constructive criticism, also Mr. Edward G. Smith who prepared the diagrams. The method of extraction outlined on pp. 754-5 has been described in greater detail in the *Dental Practitioner* (Ashcroft, G., and Pawsey, P. M., July 1957, **7**, 330), and figure 3 is reproduced by kind permission of the editor.

REVISION CORNER

THE TREATMENT OF RABIES

RABIES is communicated to man most commonly by the bite of an infected dog and occasionally by that of other mammals, such as the wolf, fox, jackal, mongoose and vampire-bat. The vampire-bat is exceptional as, so far as is known, it is the only mammal that can transmit the infection without developing symptoms of the disease. In other susceptible animals, as in man, the infection progresses relentlessly to a fatal conclusion, death occurring within a few days of the onset of symptoms.

THE RISK OF INFECTION

The uniform fatality of the developed disease has caused such a dread of the infection that there is a very natural tendency for persons to seek treatment on wholly inadequate grounds, even when they have had no direct contact with an infected animal. It is probably very rare indeed for rabies to be acquired otherwise than by the bite of a rabid animal; nevertheless, it is known that the virus can penetrate intact mucous membranes and recent abrasions of the skin, and treatment therefore cannot justifiably be withheld if such surfaces have been in contact with the saliva of an infected animal. Other factors which have to be considered in forming an estimate of the risk at which the exposed person may be placed, and in deciding the line of treatment to follow, include the situation and severity of the bites, the time which has elapsed since their infliction, and the state and fate of the biting animal. The first of these considerations is of prognostic importance. The incubation period of rabies is usually six to eight weeks, occasionally much longer or shorter. Its length varies inversely with the amount of virus inoculated, which is greater in severe wounds of unprotected areas, such as the face and hands, than in wounds of other parts of the body, which are commonly protected by clothing. It has long been known, for example, that the bites of a rabid wolf are particularly dangerous, as they are generally very severe and are usually inflicted about the face and head, with the result that the incubation period may be as little as ten days. The time which has passed since the bite is of obvious importance, as the longer it is, the shorter is the time available for useful treatment. Finally, all available information should be obtained about the biting animal. If it has escaped or been killed, it should be assumed to be rabid even if histological examination of the brain for Negri bodies should prove to be negative. If the animal has been captured, it should be isolated and kept under observation; if, after ten days, it is still alive, it was non-infective at the time of biting.

There are three complementary measures which, according to the circumstances of the case, can be used to prevent the development of rabies in an

exposed person. These are (i) local treatment of the wounds designed to wash away and destroy as much virus as possible; (ii) the induction of a rapid, though transient, passive immunity by the injection of anti-rabies serum, with the object of tiding the patient over the dangerous period of three weeks or so which elapses before the course of vaccine has begun to bear fruit in the form of antibody formation; and (iii) the induction of an active immunity by the inoculation of rabies vaccine.

LOCAL TREATMENT OF THE BITES

Much importance is attached to thorough and careful cleansing of the wound surfaces and surrounding skin at the earliest possible moment. A 20 per cent. soap solution or any other detergent is quite satisfactory for the purpose. Particular attention should be paid to any deep fang punctures, which, after irrigation, should be probed with a swab-stick dipped in strong nitric acid, which should be used carefully and sparingly. Immediate suture of lacerations is not advisable, as there is evidence that it favours invasion by the virus.

PASSIVE IMMUNITY

Anti-rabies serum (or hyperimmune serum, as it is commonly called) has become widely available in recent years. It is a purified concentrate prepared from the serum of actively immunized animals, usually horses. It is of particular value in cases of severe exposure, in which the incubation period would otherwise be too short to allow time for the development of active immunity following a course of vaccine. For the same reason, it is also of use when there has been undue delay in treatment. Moreover, it can be given as immediate treatment when the biting animal is under observation, vaccine therapy being withheld until the question of the animal's infectivity has been determined. The total dose of serum is 0.5 ml. per kilogram of body weight, and it should all be given at one time, part by local infiltration into the area of the bites and the remainder by subcutaneous or intramuscular injection. The possibility of anaphylaxis to horse serum should be borne in mind and an initial intradermal injection of 0.1 ml. should be given as a sensitivity test.

ACTIVE IMMUNITY

The production of an active immunity by specific vaccine therapy during the long incubation period has been the mainstay of the treatment of persons exposed to rabies ever since Pasteur's discoveries of 1885. The vaccines which are commonly used at present are phenolized suspensions of the brain substance of animals infected with rabies. They are given by daily subcutaneous injections, in amounts of 3 or 4 ml. each, for 14 to 21 days, according to the severity of the exposure. The injections are usually given into alternate sides of the abdominal wall; they are rather painful and often cause some redness and swelling. General symptoms, such as fever, headache and enlarged tender lymph glands, occurring towards the end of a course of vaccine, are a signal for further treatment with the vaccine in use to be

stopped, as they may herald the rare but serious paralytic accidents which are a recognized complication of neuro-vaccine therapy. If further treatment is considered essential, an 'avianized' type of vaccine can be used.

SUMMARY

On the whole, the results of treatment are very good, and it is true to say that if the recognized methods of treatment are promptly applied the chances of the disease developing are reduced to almost negligible proportions, even in cases of severe exposure.

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STRABISMUS

THERE are many kinds of strabismus but the commonest is convergent rather than divergent, comitant rather than paralytic. It makes its appearance about the age of two years, sometimes earlier. The convergence may at first be intermittent, noticed only when the child is tired, ill or excited; if ignored, it becomes constant. The parents are the first witnesses and they seek the advice of their family doctor so that ophthalmologists are entirely dependent upon the help of the medical practitioner in instituting therapy and are grateful for the ready cooperation which so many of them give.

CAUSATION

Learning to use both eyes together is a lengthy process beginning in small ways shortly after birth and progressing slowly until the age of eight to nine years when binocular vision is fully established. It is little wonder that sometimes this process is disturbed. The cause of the disturbance is usually situated in the eye itself but it may lie in its neural connexions. Children who develop convergent squints are hypermetropic. In simple terms, this means that the eyes of such a child are shorter than average and when at rest they receive blurred images. This handicap is overcome by an effort of focusing.

When we look at an object at arm's length our eyes have to function in two ways. Individually they must accommodate so as to bring diverging light-rays to a focus on the retina. Together they must converge so that each fovea is directed towards the object. Accommodation and convergence always work together and are so welded into a functional unity that it is difficult to exert excessive accommodation without at the same time applying excessive convergence.

When a child of two years with hypermetropia is beginning to take interest in toys, he has to focus in excess and quickly finds himself in a

dilemma. If he focuses adequately he will tend to over-converge and see double. If he converges adequately and fails to apply enough accommodation to overcome his hypermetropia, he will see a single object but it will be blurred. To maintain binocular vision he must make a choice between two sharp images or one blurred image, neither of which is acceptable for any length of time.

How does the child overcome this dilemma? As clarity of vision is all-important, the child subconsciously gives up the effort to maintain binocular vision. He chooses the better eye for active daily use and he ignores, and later suppresses, the image falling on the retina of the other eye. Suppression is a purposive cerebral action and is made easier by cocking the eye into the nasal corner, hence the onset of a convergent squint. As time passes suppression becomes deeper, the convergent eye sees less acutely and is said to become amblyopic or 'lazy'.

TREATMENT

We can now understand the steps taken to treat such a patient once he reaches hospital. As the essential difference between a child with a convergent squint and a normal child is the demand for excessive accommodative effort, the first step in treatment is to relieve the patient of this burden. This is done by the prescription of glasses. In order to test a child's sight it is necessary to paralyse temporarily the accommodative mechanism with atropine. Atropine eye ointment B.P. (1 per cent.) is prescribed and the mother is asked to put a little of this ointment on the lid margins three times daily for three days. The child's refractive error is then tested by retinoscopy, a method giving an objective reading of the degree of hypermetropia, or long-sight, from which the child suffers. Glasses are then prescribed for constant use.

It is most important that these glasses should be worn all day. They are put on when the child wakens and are kept there until bedtime. Most children of two years of age will accept glasses and, if necessary, they may be tied on. The provision of lenses neutralizes the basic handicap of the child and every encouragement should be given to the mother to persuade her of the importance of constant wearing of glasses as the main step in the treatment of squint. If treated in this way, within a few days or weeks of diagnosis, many cases of convergent squint can be corrected by this method alone and it is for this reason that early treatment is so important.

If, on the other hand, a child has learned to keep the convergent eye permanently at an angle and has developed deep suppression, further prolonged treatment is necessary. The next step in such a case is to encourage vision in the squinting eye. An amblyopic or lazy eye is forced into use by covering the other one. This method must be rigid and is best carried out by covering the good eye completely with surgical plaster which is worn night and day and does not interfere with the wearing of glasses. Occlusion is continued as long as any improvement is obtained in visual acuity. It may last for a considerable period of time; up to several months. Ideally it should

be carried on until the vision in the two eyes is approximately equal; in favourable cases equality of vision may be marked by the squint becoming alternating, one or other eye being used indiscriminately.

When acuity is equal in the two eyes an attempt should be made to stimulate binocular vision by *orthoptic treatment*. Children under the age of four are unable to cooperate sufficiently to enable this to be done, so that the child who is found to have an angle of squint while wearing glasses, at the age of three or less, should have his eyes put into alignment by surgery. When the child grows older, treatment is undertaken by trained orthoptists to establish and consolidate sound binocular vision because this is the surest foundation against the risk of subsequent deviation.

It must be understood that the deformity reduced by *operation* on the extra-ocular muscles is planned to relieve the degree of squint measured with the glasses in place and their use must be continued after the surgical procedure has been undertaken. This is a point which should be emphasized because it is often thought by parents that surgery may obviate this necessity. Glasses are prescribed primarily to relieve the child of excessive accommodation and, as the operative procedure does not in any way modify the length of the eyeball, it cannot relieve the accomodative strain. Growth alone may alter the size of the globe and the strength of the lens usually requires reduction as the child grows older. Hence the need for annual examinations.

CONCLUSION

Early treatment of squint is important for several reasons. The cosmetic reason requires little emphasis. Children with squints should have them corrected before they go to school because their lives may be made miserable by the cruel comments of their schoolmates. It is true that in the civilization in which we live it is possible to lead a full life without the acquirement of full binocular vision; nevertheless early treatment is most important because it avoids the widespread development of amblyopic eyes throughout the community. When we consider how much attention is given to the saving of vision in an eye which has been injured, it is amazing how casual we tend to be about the development of an amblyopic or largely useless eye. The chance of overcoming amblyopia is only given to us in childhood and if it is not taken then accurate vision may be permanently lost. This gives fresh emphasis to the important work of the family doctor in recognizing cases of convergent squint early in their development, perhaps in their intermittent stage, and in encouraging parents and children to accept, if necessary, prolonged and sometimes tedious treatment under the care of their ophthalmic colleagues.

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NOTES AND QUERIES

Medical Treatment of Parkinsonism

QUERY.—What is considered at the moment to be the best medical treatment for Parkinson's disease?

REPLY.—The medical treatment of Parkinsonism falls into two categories. Most patients are helped by the use of drugs and the solanaceous group has now been almost completely replaced by the newer synthetic remedies. Of the latter, benzhexol hydrochloride, ethopropazine hydrochloride and procyclidine hydrochloride are among the best known. Whatever drug is used the dose should be slowly increased until toxic symptoms appear. The dose should then be slightly decreased and preserved at that level. Any of these drugs can often be given in association with one of the antihistamine group. Although doubts are sometimes expressed as to the value of these drugs, any patient who has been taking them is likely to become much worse if the drug is suddenly withdrawn. Of perhaps equal importance is the use of active and vigorous physiotherapy and every effort should be made to persuade the patient to look after himself; there is a great tendency in this disease for the patient to give in to his disability, and this attitude is usually encouraged by the family.

There is little doubt that in the future there will be an increasing place for the use of surgical treatment (chemical pallidectomy).

HUGH GARLAND, M.D., F.R.C.P.

Surgical Treatment of Parkinsonism

QUERY.—What are the current views on the value of surgical treatment for Parkinson's disease?

REPLY.—The tremor of Parkinson's disease may be diminished by inflicting damage upon the pyramidal pathways, or upon the globus pallidus and its connexions. In the former case the lesion is usually made by dividing the lateral column of the spinal cord at the second cervical segment; it is the most certain method of abolishing tremor, but it leaves the patient with an unpredictable degree of hemiparesis (and hemianalgesia). In the latter case the lesion is usually made in the globus pallidus through a small trephine opening by the method of stereotaxis, and by injecting alcohol or by an electrical method. The mortality and the risk of causing hemiparesis are low (each about 2 to 3 per cent.) and in about three-quarters of the cases, tremor is relieved to a greater or lesser extent. Bilateral lesions, separated by suitable intervals, have been successfully made in some cases. It is now generally agreed that in chosen cases, i.e. paying regard to age and to vascular disease, preferably in unilateral cases in which the tremor is a major disability, surgery can offer some relief. But the patient and his relatives should not be led to believe that the disease is 'cured'.

D. W. C. NORTHFIELD, M.S., F.R.C.S.

Hæmorrhage During Anticoagulant Therapy

QUERY.—What is the treatment for hæmorrhage in patients on anticoagulant treatment? It has been my custom as a pathologist to advise that the patient carry with him two capsules of vitamin K_1; if there is any bleeding he takes this in a drink of fruit juice, stops his anticoagulant and sends for his doctor. He is also told to carry an ampoule of vitamin K_1 which the doctor can give intravenously if bleeding has not stopped. I am told that this is dangerous as it may bring on an attack of thrombosis, and that blood transfusion is better. This means admission to hospital or nursing home and carries a transfusion risk (1 in 2000 transfusions are fatal).

REPLY.—I can see no valid criticism of the advice given. Ten to twenty milligrams of vitamin K_1 given orally to a patient who is bleeding as a result of overdosage with a coumarin drug is unlikely to correct completely the coagulation defect and whilst it is true that in some instances this dose does reduce the prothrombin time to, or slightly below, normal there is no evidence that this *in vitro* 'hypercoagulability' reflects an increased tendency to thrombosis in the patient. In any event, experience of administration of large doses of vitamin K_1 in experimental trials, and in patients bleeding as a result of excessive anticoagulant effect, indicates that thrombosis as a result of this treatment must be exceedingly rare, if it occurs at all. I suspect that any misgivings on this account are more theoretical than practical.

Transfusion of blood as an alternative treatment is not altogether satisfactory. The vitamin K_1 is always at hand if the pathologist's advice is followed and the effect on the coagulation defect may be established before transfusion with its attendant delays can be given in sufficient amount to be of value. Not only must the patient seek advice but arrangements must be made to admit him to hospital. Only fresh blood or fresh frozen plasma is of any value, and even if this is available some deterioration in potency may have occurred. Furthermore, if the prothrombin time is over sixty seconds, as it may well be, the Factor VII concentration may be

less than five per cent. and would require perhaps 1000 to 1,500 ml. of fresh frozen plasma or twice this amount of fresh blood. These amounts are not always suitable for rapid administration to patients who are receiving anticoagulant therapy. These disadvantages are the greater as the need for an antidote increases, and vitamin K_1 would be the treatment of choice. This would be all the more important if, as quite often happens, the last dose of anticoagulant had been taken only a short time before.

ALEXANDER BROWN, M.D., F.R.C.P.ED., F.R.F.P.S.

Treatment of Leg Cramps

QUERY.—Is nicotinyl alcohol ('ronicol') of any real value in the treatment of leg cramps?

REPLY.—Nicotinyl alcohol is a vasodilator drug, the action of which is similar to nicotinic acid. It acts mainly on small arteries and arterioles, and is used for various disorders producing vasoconstriction, such as Raynaud's disease, migraine, Ménière's syndrome, and also thromboangiitis obliterans. Nociceptive responses produced by these disorders, such as pain and cramp in the legs, can be treated by this drug with beneficial results. On the other hand, it has no beneficial effect on spasticity due to lesions of the pyramidal tracts.

L. GUTTMANN, O.B.E., M.D., M.R.C.P.

Chilblains and Pregnancy

QUERY.—(1) It is commonly observed that chilblains disappear, and cold limbs become warmer during pregnancy—and this change can persist long after or permanently. Has any research on this subject disclosed why this should happen, and is there any therapeutic application of the results of the investigation?

(2) Can you suggest an effective remedy for persistent cold hands and feet, in the absence of any evidence of organic disease and with palpable pulses present? There are no chilblains, and the only associated finding is the accumulation of moisture in the socks. The limbs do warm up, but very slowly and any attempt to accelerate the process—e.g. by bathing in hot water—is followed by a rapid resumption of the cold state after a temporary improvement.

REPLY.—(1) The answer to the first of these two interesting questions is that, so far as can be ascertained, no research has been carried out on the question of why chilblains may disappear in pregnancy. Presumably the raised metabolic rate with increased cardiac output is an important factor in producing this effect. A therapeutic application of this idea is referred to in the answer to the second question.

(2) The second question does not mention whether the persistently cold extremities are of normal colour or cyanosed as in acrocyanosis. This condition may be benefited by the use of vasodilator drugs such as tolazoline or phenoxybenzamine, in conjunction with ordinary measures such as the wearing of gloves and fur-lined boots. Basal metabolic rate estimations have suggested that persistently cold extremities are sometimes associated with a reduced rate, and in a few cases good results have been obtained by the use of a combination of triiodothyronine (25 micrograms twice daily) and phenoxybenzamine (30 mg. twice daily). The triiodothyronine should be discontinued during the summer months. The usual precautions with regard to the avoidance of side-effects with this drug should be observed. This treatment should be reserved for cases with considerable disability.

Sympathectomy should be considered in severe cases with ulceration, which have failed to respond to medical treatment. Arteriographic studies have shown congenital absence or hypoplasia of parts of the peripheral arterial tree in some patients with cold cyanosed and ulcerated extremities, and treatment by arterial grafting has resulted in improved peripheral blood flow. From the wording of the question and the absence of Raynaud's phenomenon, it may be assumed that the cold extremities are not an expression of a systemic disorder such as early scleroderma, cryoglobulinæmia or Buerger's disease.

Finally, the possible importance of psychological factors may be considered, as many people have persistently cold hands and feet, and do not usually, in the absence of chilblains, seek medical advice.

E. N. M. JOHNSTON, M.R.C.P.

'Durabolin' in Thin Women

QUERY.—Is 'durabolin' safe for healthy women—pregnant or non-pregnant—who happen to be rather thin?

REPLY.—'Durabolin' (Organon) is 19-norandrostenolone phenylpropionate, a so-called nitrogen-anabolic steroid esterified so as to be slowly absorbed on intramuscular injection and therefore relatively long-acting. When compared with testosterone for its ability to cause nitrogen retention, doses of 'durabolin' which are equally effective are substantially less virilizing than the corresponding doses of testosterone. For this reason, it may be possible to obtain nitrogen retention, due to protein synthesis, and gain in weight, in women without virilizing side-effects. On the other hand, some women are so sensitive to androgenic substances that therapeutic doses

of even the 'non-virilizing androgens' will cause virilizing changes: growth of facial hair, acne and, if treatment is continued, menstrual disturbances, irreversible deepening of the voice and enlargement of the clitoris. For this reason there are some who doubt whether any androgenic substances should ever be prescribed for women—but this is an extreme view.

There is probably no justification for prescribing 'durabolin', or other similar androgenic substance, in pregnancy. A number of cases of female pseudohermaphroditism of non-adrenal origin, born to mothers receiving androgen therapy or progesteronal steroids related to the androgens during the pregnancy has been reported (Nellhans, G., *New Engl. J. Med.*, 1958, **258**, 935; Reilly, W. A., *et al.*, *Amer. J. Dis. Child.*, **95**, 9; Wilkins, L., *et al.*, *J. clin. Endocr.*, 1958, **18**, 559). Although these congenitally deformed children are a much less serious proposition than the more familiar pseudohermaphrodites of adrenal origin, it is obviously unwise to risk such an outcome to the pregnancy without compelling reason.

G. I. M. SWYER, D.M., M.R.C.P.

Hazards of U.V.L.

QUERY.—Is there any danger liable to arise from giving prolonged courses of ultra-violet light (U.V.L.)? In chronic cases of acne the patient seems to benefit, both from a cosmetic and psychological aspect, from a prolonged course. I seem to remember having read somewhere that artificial sunlight may be a cause of skin cancer.

REPLY.—There is no doubt that ultra-violet light has a beneficial action in several chronic dermatoses, particularly in the treatment of psoriasis and acne vulgaris. As a generalization, any form of therapy in medicine which is of benefit to the patient is also potentially harmful and U.V.L. is no exception to this.

The most obvious ill-effect is the burning produced by overexposure, and U.V.L. is contraindicated in patients who have developed a specific sensitization to sunlight; in these people U.V.L. causes dermatitis of the exposed areas. Since photosensitization is in some cases associated with the simultaneous taking of various drugs, to avoid the establishment of such a state the patient should not take sulphonamides, aspirin or phenolphthalein-containing medicines during the course of treatment. Such a state of photosensitization is uncommon.

The production of skin cancer by U.V.L. used therapeutically must be extremely rare. Cancer of the skin does occur in white-skinned races after exposure to strong sunlight in the dry atmosphere of such countries as Australia and some parts of America, but this takes place only after exposure for many years. The only other hazard to remember is the possible activation of a latent tuberculous focus, particularly in the lung.

H. R. VICKERS, V.R.D., M.B., F.R.C.P.

PRACTICAL NOTES

Iproniazid in Angina Pectoris

IPRONIAZID is 'highly effective in the prevention of pain due to ischæmia', according to P. Cossio (*American Heart Journal*, July 1958, **56**, 113) as a result of his experience with its use in 120 patients with angina pectoris. In one-third of the patients the pain subsided entirely or almost entirely within three to seven days, whilst in another third the frequency, intensity and duration of attacks were markedly diminished. Two-thirds of the patients had side-effects—faintness, weakness, syncope, impotence, or muscular twitchings—but these are said never to have been serious. Two alternative dosage schedules are described. In the first the initial dosage is 50 mg. every eight hours which is maintained until a satisfactory response is obtained, and then gradually reduced until the minimal effective dose is reached. The alternative method is to give 25 mg. every eight hours for a week, followed by 50 mg. every twelve hours for a month, and then 50 mg. every eight hours until a satisfactory response is obtained.

In a smaller series of 40 cases M. K. Towers and Paul Wood (*British Medical Journal*, November 1, 1958, **ii**, 1067) found iproniazid was 'highly effective in reducing the frequency and severity of anginal attacks', but recommend that it should not be used in patients with mild angina pectoris. The dosage they used was 50 mg. twice or thrice daily. In neither of these series was there any evidence of liver damage arising from the use of iproniazid, although jaundice has been reported as a complication of long-continued use of the drug.

Treatment of Aphthous Stomatitis

RAPID healing of ulcers and disappearance of symptoms occurred when patients with aphthous stomatitis were treated with *Lactobacillus* suspension tablets by Don J. Weekes (*New York State Journal of Medicine*, August 15, 1958, **58**,

2672). Following dramatic improvement in the oral lesions of two patients who were receiving these tablets for diarrhœa due to broad-spectrum antibiotics, he decided to try the same treatment in a small group of patients suffering from aphthous stomatitis. The dosage was two tablets, dissolved in the mouth with milk, four times daily, and in four out of six patients the lesions cleared completely within two days. One of these four patients was a 42-year-old graduate nurse admitted to hospital with 'severe dehydration and oliguria resulting from severe aphthous stomatitis with limitation of intake,' and forty-eight hours after treatment 'all ulcers were healed, she was taking fluids well, and urine volume returned'. Although healing was rapid in the two remaining patients, one of whom had vesicular lesions involving the skin of the lower lip which were 'fairly typical of herpes simplex' and were thought to be due to overexposure to the sun, the lesions recurred when treatment was stopped and it was therefore necessary to continue it indefinitely. 'Studies are under way in an effort to determine the mechanism of this agent'.

Buffered Versus Non-buffered Aspirin

A COMPARISON of the effects of acetylsalicylic acid alone and with buffering agents revealed that differences in onset, duration and effectiveness of clinical analgesia as well as tolerance are clinically indistinguishable, according to Max S. Sadove and Lester Schwartz (*Postgraduate Medicine*, August 1958, **24**, 189). In a series of 354 patients, 199 were rheumatic or arthritic hospital patients with the types of 'primarily static pain known to respond to salicylate therapy' and 155 were medical and surgical patients in a general hospital who had 'primarily nonstatic acute and subclinical pain'. Using a double-blind technique in which neither physician nor patient knew the identity of the analgesic other than by code, half of the patients were given tablets containing 0.3 g. of acetylsalicylic acid and the other half tablets containing 0.3 g. of acetylsalicylic acid, 45 mg. of aluminium glycinate and 100 mg. of magnesium carbonate. Dosage was two tablets every four hours for as long as necessary, and the tablets were changed over every twenty-four hours so that patients with pain persisting for more than twenty-four hours got both tablets and thus acted as their own controls. The following observations were recorded in each patient: time of onset of pain relief, degree of pain relief (complete, moderate, mild or none), duration of pain relief (time when pain returned, and side-effects). It was concluded that 'the addition of buffering agents to acetylsalicylic acid serves no useful purpose detectable by either clinical or laboratory means presently available regarding either analgesic actions or tolerance'.

Triamcinolone in Systemic Erythematosus

MANY patients with systemic lupus erythematosus are helped more by triamcinolone (9*α*-fluoro-16*α*-hydroxyprednisolone) than by the older steroids, according to E. L. Dubois (*Journal of the American Medical Association*, July 26, 1958, **167**, 1590) based upon an analysis of the results he has obtained in 31 patients. Fourteen of these patients had received treatment with other steroids before being given triamcinolone, and seven of these were better controlled and felt better when receiving triamcinolone. The average initial dose for mild cases was 20.6 mg. daily, whilst the average maintenance dose to control mild exacerbations was 26 mg. daily. As male patients did not show Cushingoid features with this steroid, even in doses as high as 48 mg. daily for six weeks, it is suggested that in men it may be the drug of choice. The worst side-effect in this series was muscular weakness, which appeared in six patients from four to thirty-two weeks after starting treatment. It was most marked in the quadriceps muscles and cleared gradually after several weeks' treatment with some other steroid. No cases occurred among the seven males in the series. Triamcinolone has two disadvantages: it is more liable to produce cutaneous side-effects (e.g. hirsutism and striæ) than other steroids, and it varies greatly in potency from patient to patient. For this reason the author prefers to initiate therapy with hydrocortisones unless 'there is a problem of cardiorenal disease'.

Treatment of Recurrent Styes

THE recommendation that patients with recurrent styes should be treated with an antibacterial ointment 'applied to both the nose and the eyes, and not to the eyes alone as is common practice', is made by P. W. M. Copeman (*Lancet*, October 4, 1958, **ii**, 728), who found that in a series of 36 such patients, 34 (94%) carried *Staphylococcus aureus* in the anterior nares. Alternate patients were treated with an ointment containing a mixture of neomycin and gramicidin ('graneodin') and with a control ointment containing only the inert base. In 11 of those treated with 'graneodin', who had had styes varying in frequency from one every few days to one or more a month, the clearance of *Staph. aureus*

from the nose was accompanied by cessation of the styes. Six of these have been shown by bacteriological examination to have been free from nasal *Staph. aureus* for more than three months, during which time none has had a single stye. Six comparable patients of the control series, who were found to be persistent nasal carriers, had between them more than twenty styes during the same period. Although in this series successful results were obtained by applying the ointment to the anterior nares alone, 'it is logical to treat the stye itself also to avoid transference of infection'. The following course of treatment is therefore recommended: simultaneous application of 'non-systemic' antibiotics to both eyelids and to the anterior nares, four times a day for ten days, followed at two-weekly intervals by courses of seven days' treatment, which 'is frequent enough to avoid recolonization of the nares'. In addition, to reduce the possibility of re-infection, as much as possible of the patient's clothing and bedding should be cleaned.

Parenteral Novobiocin

As a result of his experience with 17 'desperately ill' patients, M. W. Garry (*American Journal of the Medical Sciences*, September 1958, **236**, 330) concludes that 'parenteral novobiocin is therapeutically effective and offers a reasonable expectation of a favourable response even in seemingly hopeless cases'. The intravenous route was used in eight patients, the intramuscular in eight, whilst in one both routes were used. The daily dose was 1 or 2 grammes daily, given in divided doses. The most commonly used dosage was 500 mg. every six hours. The solution for intravenous administration was prepared by adding 5 ml. of sterile solution N,N-dimethylacetamide, 10%, to the vial containing 500 mg. of sterile novobiocin. This concentrated solution was added to 500 or 1000 ml. of isotonic sodium chloride solution and administered by continuous drip infusion. The intramuscular solution was prepared by adding 3 ml. of sterile N,N-dimethylacetamide, 10%, to the vial containing 500 mg. of sterile novobiocin. Solution was obtained promptly by gentle agitation, and the material was injected deeply into the gluteal muscle; when administered slowly there was no complaint of pain or distressing local reaction. No side-effects were encountered with either method of administration.

Tranquillizers in Mental Defectives

CHLOROPROMAZINE 'appears to be an effective drug, and a predictable one, in reducing severe self-mutilation, tension-reducing behaviour, and assaultive or aggressive acting-out behaviour in a large majority of low-grade mentally deficient patients', according to W. C. Adamson and his colleagues (*A.M.A. Journal of Diseases of Children*, August 1958, **96**, 159). It is stressed, however, that it is not a panacea, but merely an ancillary form of treatment. In the 40 patients, whose ages ranged from 8 to 40 years, upon whom the effect of tranquillizers was investigated, no evidence was obtained of any improvement in intelligence or social maturity. These conclusions are based on an investigation, which extended over a year, in which the effects were compared of chloropromazine (300 to 500 mg. daily), reserpine (3 to 5 mg. daily), a combination of these (150 to 200 mg. of chlorpromazine and 1.5 to 2.5 mg. of reserpine daily) and a placebo. In four different groups, clinical improvement occurred in 80% to 100% of patients with chlorpromazine, 70% to 100% with reserpine, 70% to 90% with the combination of these two drugs, and 40% to 70% with the placebo. The beneficial effect of the placebo lasted for about six weeks, and the view is therefore expressed that 'a period of eight weeks of receiving a specific drug is believed to be minimal for reliable observations in all research designs concerned with effectiveness of drugs on behaviour'.

Irradiation in Carcinoma of the Pancreas

RADIATION therapy 'offers no appreciable palliative benefit to patients with carcinoma of the pancreas', according to J. S. Billingsley and his colleagues (*Proceedings of the Staff Meetings of the Mayo Clinic*, August 20, 1958, **33**, 426). During 1955, 64 cases of 'carcinoma of the pancreatic exocrine parenchyma' in which the diagnosis was established histologically, were dealt with at the Mayo Clinic. Cases of pancreatic islet cell tumour were not included in this group. Radical excision was performed in 12 patients. Of the remaining 52 patients, 29 were treated with some form of palliative operation (e.g. choledochoduodenostomy, gastroenterostomy), whilst 20 underwent no surgical procedure. Six of the surgical group received post-operative radiation treatment and seven of the non-operated received similar irradiation. This was given by a cobalt teletherapy unit, the average tumour dose being 3000r given over an average of nineteen days. There was no significant difference in survival time between those receiving radiotherapy and those who did not. Neither was there any symptomatic improvement: 'indeed', the authors say, 'many of

the patients experienced considerable discomfort as a result of radiation reactions'. It is suggested, however, that possibly with higher dosage in carefully selected patients there might be some advantage in using radiotherapy.

Mitral Valvuloplasty in Patients Over Fifty

PATIENTS over fifty who have mitral stenosis should, in selected cases, be offered surgical relief 'with the same assurance that is justified at an earlier age', according to Harrison Black and Dwight E. Harken (*New England Journal of Medicine*, August 21, 1958, **259,** 361). Comparison of a series of 154 patients between the ages of 50 and 70 with a larger series of younger patients revealed that, despite the more common existence in the older patients of such adverse factors as 'preoperative arterial embolization, associated arteriosclerotic heart disease and elevated blood pressure, when similar stages of disease were compared 'the operative risk, frequency of late death and percentage of improvement after operation' were practically identical in both groups.

Denervation of the Lacrimal Gland in Epiphora

IN cases of epiphora due to blockage of the lacrimal passages in which it is impossible to produce effective drainage, denervation of the lacrimal gland may give considerable relief, according to John Whitwell (*British Journal of Ophthalmology*, September 1958, **62,** 518) who describes an operation 'designed to cut the lacrimal branch of the zygomatic nerve as it enters the lacrimal gland'. Of the six patients in whom the operation was performed, a successful result was obtained in four. One of these had had a right facial palsy with partial recovery three years previously, one had complete obstruction of both canaliculi about 3 mm. from the puncta, and two had had a left dacryocystectomy. In one of these, a woman aged 57, the dacryocystectomy had been performed fourteen years previously; following a left denervation she reported that she 'can now peel onions without the left eye watering'. Of the two cases in which operation was not successful the epiphora followed radium treatment to the inner canthus for a rodent ulcer in one (who is awaiting further operation), and was due to inefficient drainage without apparent obstruction in the other.

Ruptured Intracranial Aneurysm

IN the opinion of F. J. Gillingham (*Annals of the Royal College of Surgeons of England*, August 1958, **23,** 89), 'patients who have suffered from their first, and often minor, episode of subarachnoid bleeding should be referred as a matter of urgency for neurosurgical investigation and treatment'. Over 30% die of recurrent bleeding after the first twenty-four hours, and an additional 20% after the first three weeks have elapsed. When the patient is little disturbed by the attack, operative mortality is correspondingly low. Mortality is especially high in the anterior communicating and basilar aneurysms. In this series of 80 patients operated on by the author between February 1950 and February 1956, the over-all mortality was 21.25%. This compares favourably with the 50% mortality which accompanies expectant treatment and, according to the author, 'it can be lessened considerably by the earlier reference of patients and early operative treatment following the first episode, by better timing of angiography and operation, and by the type of operative procedure used'. Confirmation of this opinion is obtained in a subsequent series of 47 cases seen between February 1956 and February 1958. In this group, although the operative mortality was approximately the same (22.2%), this was largely because of a 'determined approach to the problem of multiple aneurysms'. In the remaining group of 20 cases there were only two deaths, giving a mortality of 10%, and—in retrospect—both these fatalities were avoidable: meningitis from spinal drainage, and death from an ill-timed operation.

Palpating the Liver

THE importance of body build and of the slanting angle of the liver in assessing the size of the liver as assessed by palpation is stressed by F. G. Fleischner and V. Sayegh (*New England Journal of Medicine*, August 7, 1958, **259,** 271). In a radiological study, in the prone position, of 120 patients with normal livers they found that in 95% of those with the slanting angle of the liver less than 42° the liver edge was at, or one fingerbreadth below, the costal margin. On the other hand, among those with a steep slope of the liver edge there was a more or less even distribution in the downward extension of the liver reaching 1, 2, 3, and 4 fingerbreadths below the costal margin. As an example of the clinical significance of these observations, they quote the following examples. 'Thus, if the liver edge is found 3 or 4 fingerbreadths below the costal margin in a slender person of the hyposthenic or ectomorph type and the slanting angle is large, 50° or 60°, then the liver is of normal size. Contrarily, if in a hypersthenic subject with a small slanting angle of the edge, the liver reaches only 2 fingerbreadths below the costal margin, the liver is probably considerably enlarged'.

REVIEWS OF BOOKS

Textbook of Surgery. Edited by GUY BLACKBURN, M.B.E., M.CHIR., F.R.C.S., and REX LAWRIE, M.S., F.R.C.S., M.D., M.R.C.P. Oxford: Blackwell Scientific Publications, 1958. Pp. xii and 1122. Illustrated. Price 84*s*.

THE vast scope of modern surgery, its steady development, and the change of emphasis soon combine to render a textbook of surgery out of date. It is in the belief that an entirely new book is needed that this one has been produced. It is written by members of the staff of Guy's Hospital and is specifically designed for the undergraduate, providing a comprehensive survey, succinctly and without cramming, of the whole field of general surgery. In spite of the claims it is a little unbalanced if regarded, as it is, as a book for the undergraduate. The surgery of the heart and blood vessels occupies seventy pages, including descriptions of all sorts of conditions—septal defects, coarctation, hæmodynamics, and so forth, which, however well written and good, are hardly likely to be of much value for the student. There are one hundred pages on x-ray diagnosis and therapy, twenty-four on anæsthesia, and twenty-five on water balance. No doubt it is good to have the cooperation of the whole staff of Guy's to make it a family concern.

Most of the subjects are very well done and one would particularly commend the chapters on the breast and those on the stomach and duodenum. The orthopædic sections are minimal, sketchy, and of no particular value, but doubtless the undergraduate will have enough that is essential. The text is lucid and concise and is more uniform than usual in a book with so many authors. The illustrations reach a high standard, as indeed does the whole production of the book.

Basic Surgery. Edited by LESLIE OLIVER, M.B., B.S., F.R.C.S., F.A.C.S. London: H. K. Lewis & Co. Ltd., 1958. Pp. xvi and 1360. Illustrated. Price £6 6*s*.

THIS is an excellent book, well written, well illustrated and well produced. The publishers have done a fine job, and the figures, including many in colour, are faultless. The editor has clearly been at great pains to see that this new work is a worthy companion to the many winners and stayers that have come from the Great Northern stable. The preface claims that the book 'has been written primarily for undergraduate students'. Section I (abdominal surgery), sections VI and VII (face and neck), section IX (the breast) and sections XIII and XIV (trimmings) are good undergraduate stuff, clear and well documented. Section X (vascular surgery) and sections XI and XII (orthopædics) are a little long and advanced for any but the more intelligent and industrious undergraduate, but they are so well written and illustrated that they well repay study. The remaining sections are brilliant monographs by super-specialists, that might have been planned for a UNESCO surgical exhibition by a Ministry anxious to 'sell' British surgery, and prepared to pour out public money for the purpose. The title, 'Basic Surgery', is possibly misleading. 'Basic English' is the grammatical but unlovely jargon of the cosmopolitan highbrow. The 'basic sciences' preparatory to surgery are anatomy, physiology and pathology. 'Basic Surgery' should surely lead on from the basic sciences, and deal with fundamentals. This book plunges straight into the appendix and finishes with radiotherapy, and in between it goes for the altitude record. It does not deal with the reactions of the body to injury and infection, or with cancer, as basic biological problems. It is 'apical surgery' rather than 'basic surgery.'

This is a book that every library must keep, that every surgeon should buy, and that most senior students should consult.

Obstetrics and Gynecology. By J. R. WILLSON, M.D., C. T. BEECHAM, M.D., I. FORMAN, M.D., and E. R. CARRINGTON, M.D. London: Henry Kimpton, 1958. Pp. 605. Figures 267. Price 80*s*.

THIS text from the staff of the Department of Obstetrics and Gynecology of Temple University Medical Center, Philadelphia, is written for the undergraduate student and as a guide to the family physician. Obstetrics and gynecology are not strictly separated but interwoven as normal and abnormal features of various stages of life. The authors have admirably succeeded in their primary task, and have produced a well-balanced, carefully planned instructional manual, ideal for the audience for which it is designed. The specialist teacher will find it an excellent guide to undergraduate and midwife lectures, and will find very little with which he might disagree. In a book so well written it is invidious to pick out specific chapters for praise, but that on 'cervical cancer' is an excellent example of how, in a relatively short space, a subject can be admirably presented without reference to intricate and specialized details.

There are two chapters which merit helpful criticism. That on the physiology of the fœtus is disappointing. In recent years much new work has been done, with special reference to the effects on the fœtus of abnormal pregnancy and labour, and although this is still entirely at research level, a short discussion would have

been much to the students' advantage. It is also unfortunate that complicated classifications of pelvic shape and size are still used in undergraduate teaching as, almost certainly, they blur student thinking on what is, clinically, a relatively simple problem. The direct relationship between maternal height and pelvic brim, shape and size, is not mentioned.

This book is one of the best available undergraduate texts in English and is strongly recommended.

Heart Disease in Infancy and Childhood. By JOHN D. KEITH, M.D., RICHARD D. ROWE, M.B., F.R.C.P.ED., and PETER VLAD, M.D. New York and London: The Macmillan Company, 1958. Pp. xiv and 877. Illustrated. Price £7 17*s.* 6*d.*

GREAT strides have been made in the diagnosis and treatment of congenital heart disease in infancy and childhood in the past ten years, and there has been a great need for a comprehensive review of the subject. Problems of diagnosis which arise in this age-group are often overlooked in the standard textbooks on cardiology and, although much has been written on the subject in recent years in a wide variety of periodicals, it is difficult for the clinician to keep in touch with all this literature. It is all well reviewed in this book which brings all the facets of the subject together in proper balance and perspective. The book begins with a chapter on the incidence and etiology of congenital heart disease and the embryology is briefly discussed. There is then a clear description of the findings on clinical, electrocardiographic and radiological examination in the normal child at various ages. The diagnostic procedures of cardiac catheterization, angiocardiography, aortography and oximetry are fully explained and their uses defined. Keith and his colleagues draw from their extensive personal experience in describing the findings in the various lesions. A chapter is devoted to each congenital heart lesion, and anatomy, etiology, incidence, hæmodynamics, clinical features and results of investigations are detailed. The complications of the lesion are fully explained and then follow the differential diagnosis, prognosis, and treatment both medical and surgical. Rare anomalies which are so often cursorily dealt with elsewhere are fully discussed.

Although the major part of the book concerns congenital heart disease, rheumatic fever and rheumatic heart disease are described with the same thoroughness. The illustrations are of high quality and there are many useful line drawings showing the typical radiographic appearances of the heart in various lesions. This book will prove indispensable to pædiatric cardiologists and will also be of value to general pædiatricians, cardiologists, and workers in general medicine and surgery, whose interests may extend to this field. To them it will give a graphic picture of the rapid developments which are taking place in the management of heart disease in childhood.

The Practice of Nuclear Medicine. By W. H. BLAHD, M.D., F. K. BAUER, M.D., and B. CASSEN, PH.D. Springfield, Illinois: Charles C Thomas; Oxford: Blackwell Scientific Publications, 1958. Pp. xxiii and 407. Figures 112. Price 95*s.*

Radioisotope Techniques in Clinical Research and Diagnosis. By N. VEALL, B.SC., F.INST.P., and H. VETTER, M.D. London: Butterworth & Co. (Publishers) Ltd., 1958. Pp. xii and 417. Figures 74. Price 50*s.*

IT is a sign of the times that two textbooks on 'nuclear medicine' should appear almost simultaneously—one from the United States and the other a joint London-Vienna effort. Both aim at providing the essential facts in as simple language as possible with a view to allowing the clinician to understand the principles involved in this growing branch of medicine.

The only real difference between the two is one of emphasis. In the American volume the emphasis is upon the clinical uses of isotopes, whereas the other pays more attention to the technical aspects and stresses the research and diagnostic uses rather than the clinical uses. To this extent the two books are complementary, but the clinician will find the American book the more useful. Apart from anything else it shows a better balanced judgment than the other. For the young research worker or the junior hospital physicist, however, the London-Vienna production will prove the more valuable.

The Kidney. By H. E. DE WARDENER, M.B.E., M.D., F.R.C.P. London: J. & A. Churchill Ltd., 1958. Pp. viii and 338. Figures 74. Price 45*s.*

IN recent years a number of texts have appeared dealing primarily either with the histology of the kidney or with renal physiology. Whilst these are valuable to the specialist, they make little appeal to the practitioner or the general physician. The merit of this book lies in the fact that it presents, in a moderate compass, an up-to-date and authoritative synthesis of the recent advances in our understanding of the way the kidney functions and relates this knowledge in a lucid and stimulating fashion to the practical problems in the management of renal disease. It will be especially

useful to those who, with limited time, desire to keep abreast of modern medicine.

The opening chapters are devoted to a consideration of the normal structure and function of the kidneys. There is a brief description o the detailed structure of the nephron as revealed by the electron microscope, and a section on the technique for obtaining kidney tissue by percutaneous biopsy. Those not familiar with modern concepts of glomerulo-tubular functions and of the tests used to assess the integrity of these functions, will be as grateful for Dr. de Wardener's lucid outline of this subject as they will be appreciative of the absence of the mathematical abstractions in which these functions are often shrouded. There follow chapters on the nephrotic syndrome, acute renal failure, chronic renal failure, the acute nephritic syndrome, and on the relationships between renal disease and hypertension, œdema and water and electrolyte imbalance. The second part of the book describes renal diseases in terms of etiology, diagnosis and treatment. Proper emphasis is given to the etiology and treatment of pyelonephritis and acute tubular necrosis; the two renal diseases that are not only often preventable but amenable to treatment.

Woman's Change of Life. By ISABEL HUTTON, C.B.E., M.D. London: William Heinemann Medical Books Ltd., 1958. Pp. x and 124. Price 6*s*.

THE change of life looms large in the minds of many women and most face it with a varying degree of apprehension. This little book has been written for the laywoman who is approaching the menopause and it deals very comprehensively with every aspect of the subject. It is very readable and is written in a clear easy style which is immediately appealing. It does not aim to describe treatment and where it does there are points to criticize, for example, the suggestion that subtotal hysterectomy may be preferred for menopausal bleeding or that penicillin should be given for vaginal infections.

This book can safely be recommended to women who fear what may happen to them at the menopause and it should help to dispel the many fallacies which are prevalent not only in the minds of laywomen, but often in those of their medical attendants.

Marriage Counselling. BY J. H. WALLIS and H. S. BOOKER. London: Routledge and Kegan Paul Ltd., 1958. Pp. xiii and 313. Price 25*s*.

THIS will undoubtedly be the standard work on the subject for many years to come. It describes the development of Marriage Guidance Councils, the methods of selecting, training and assessing counsellors, and then analyses some 25,000 cases, illustrated by more than 150 statistical tables and numerous brief case-histories. Study of these brings home what a difficult business this is, and increases admiration for the men and women who voluntarily devote themselves to it. How often are they successful? It depends, says Mr. Wallis, on what is meant by success. 'One would hope that any final break-up of the marriage is no longer regarded as inevitable or desirable; that feelings of hostility between the partners are better understood by both of them; that the atmosphere in the marriage is more stable and secure for both parents and for their children'. Mr. Booker's analysis seems to show that in about one-third of the cases the counsellors thought they had done good, in about one-third they saw evidence of no improvement, whilst in the other third they did not know what the result had been.

Medicine and the Navy. BY J. J. KEEVIL. Vol. II, 1649-1714. Edinburgh: E. & S. Livingstone Ltd., 1958. Pp. ix and 332. Illustrations 19. Price 40*s*.

THIS second volume—unfortunately posthumous—covers a period when the medical naval service began to develop a clear form in so far as sea-surgeons began to form a component part of the Navy. Of organization, however, there was still little evidence, although by the end of the period covered, hospital ships were accepted as an essential part of the fleet. Medicine as a profession does not come well out of the story, the surgeons and the apothecaries being too preoccupied with their internecine struggles to give Their Lordships the service to which they were entitled. In view of this failure to put first things first, it is not surprising that naval captains insisted upon having complete control over the surgeons appointed to their ships.

As in the first volume, the fascinating story is unfolded with a wealth of detail and a skill which betokens the care and thought which were devoted to the task.

NEW EDITIONS

Diseases of The Nervous System, by Sir Francis Walshe, M.D., D.SC., F.R.C.P., F.R.S., in its ninth edition (E. & S. Livingstone Ltd., 30*s*.) has undergone careful revision. Two new chapters have been added—on the neurological complications of liver disease, and on hepatolenticular degeneration—and the chapter on vascular disorders of the brain has been largely rewritten. This book is now one of the classics of medicine. Clear, concise and authoritative,

it bears the hallmark of the author's clinical acumen and wide knowledge of the specialty of which he is the outstanding representative at the present day.

A Text-Book of X-ray Diagnosis, Vol. III, edited by S. Cochrane Shanks, C.B.E., M.D., F.R.C.P., F.F.R., and Peter Kerley, C.V.O., C.B.E., M.D., F.R.C.P., F.F.R., third edition (H. K. Lewis & Co. Ltd., £6).—The potential value of diagnostic radiology in conditions involving the alimentary canal, the urinary tract and the abdomen and also in the field of obstetrics and gynæcology is amply demonstrated in the present volume which, with its companions constitutes the full work and may now be acclaimed as one of the outstanding textbooks produced by British medicine. S. Cochrane Shanks and A. S. Johnstone are responsible for the major portion dealing with the alimentary canal and all the common and many uncommon conditions are described and illustrated. The new edition incorporates the recent work of Johnstone, Harrington and other workers on the œsophagogastric junction and the production of hiatus hernia. Particularly clear and informative are the section on the stomach and duodenum after operation and Teall's contribution on the alimentary canal in infancy. Conditions of the small and large bowel are correlated briefly with the clinical picture and the first-class radiographic reproductions are supplemented by a select number of line drawings. Kerley's contribution on the biliary tract includes a critical appraisal of the newer contrast substances. Many readers, particularly the general practitioner, will find the obstetrical section the most valuable. It is thoroughly up to date, it does not minimize the hazards and yet it pronounces clearly the important application of radiology in this field. Largely the work of Rohan Williams, it includes special contributions from such authorities as Chassar Moir, Blair Hartley, Howard Moloy and Peter Allen.

Handsomely produced and well written throughout, this textbook illustrates pathology in the living as well as the practical use of radiology in individual diagnostic problems. It has confirmed its claim to a place in the library of everyone who practises clinical medicine.

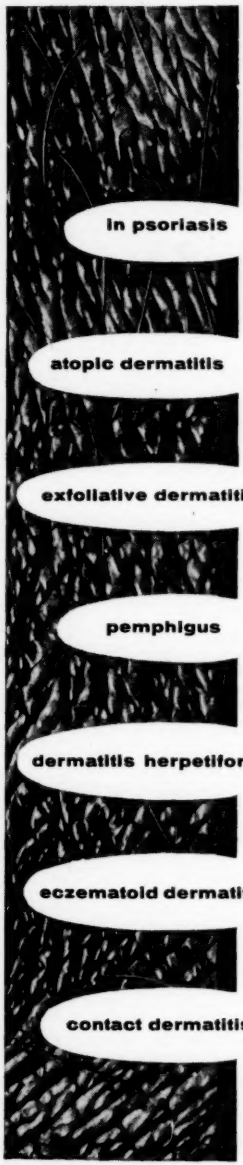
The Facts of Mental Health and Illness, by K. R. Stallworthy, M.B., CH.B., D.P.M., in its second edition (Christchurch, New Zealand: N. M. Peryer Ltd.; London: Lloyd-Luke (Medical Books) Ltd., 22*s*. 6*d*.), is a simple statement of the facts of psychiatric syndromes which can be thoroughly recommended not only to doctors but to intelligent laymen. Its facts are far more numerous and clearly stated than the slightness of the volume suggests.

Skin Grafting, by J. B. Brown, M.D., and F. McDowell, M.D., third edition (Pitman Medical Publishing Co. Ltd.).—This very comprehensive book is a reflection of the work done in one of the best plastic surgery units in the United States. It is copiously illustrated with excellent photographs, and the authors have been at pains to deal with the whole field of skin grafting, the major emphasis being on burns. There are also comprehensive sections on the treatment of x-ray necrosis, freezing injuries and gun-shot wounds of the face and jaw. In addition all the technical problems of grafting that vary from one situation of the body to another are fully dealt with. The chief emphasis is placed on accurate diagnosis of skin loss, prompt replacement with free skin grafts, and the importance of following the patient right through to ultimate rehabilitation. This book will be of particular value to the general surgeon unable to call in a plastic colleague, and to the trainee in plastic surgery. The wealth of technical detail places it beyond the immediate scope of general practice, but all who can spare time to browse through the illustrations will be richly rewarded.

Textbook for Midwives, by Margaret F. Myles, S.R.N., S.C.M., H.V.CERT., SISTER TUTOR CERT., M.T.D., third edition (E. & S. Livingstone Ltd., 42*s*.).—That this comprehensive textbook has had two editions and two reprints within five years is adequate testimony to its wide popularity. Extensive revision succeeds in bringing this edition into line with current thought and practice. The sections on abortion, pre-eclampsia, the elderly primigravida, abnormal uterine action, radiology, prematurity, and neonatal asphyxia have been considerably amended, and the chapter on ante-partum hæmorrhage has been reorganized. Additional material includes low-salt and weight-control diets, the grande multipara, and non-engagement of the head. It is pleasing to note some sensible advice to the Rhesus-negative woman. There are several new illustrations and photographs. Based on the author's wide practical and teaching experience, the book will continue to prove very helpful to pupil midwives, sister tutors, and candidates for the midwife teachers' examination—and indeed to general-practitioner obstetricians.

The contents of the January issue, which will contain a symposium on 'Vitamins,' will be found on page A 114 at the end of the advertisement section.

Notes and Preparations see page 773.
Notes from the Continent see page 777.
Fifty Years Ago see page 779
Motoring Notes see page A 85.
Travel Notes see page A 89.
Annual Report of College of General Practitioners see supplement pages 1-48



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[1]J.A.M.A. 165: 14: 1821-1823 (Dec. 7) 1957.
[2]J.A.M.A. 167: 8: 959-964 (June 21) 1958.

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NOTES AND PREPARATIONS

NEW PREPARATIONS

'BIOMYDRIN' nasal spray contains neomycin sulphate, 0.1%; gramicidin, 0.005%; thonzylamine hydrochloride, 1%; phenylephrine hydrochloride, 0.25%; thonzonium bromide, 0.05%, and thimerosal, 0.002%. It is 'designed to relieve the symptoms of nasal congestion and to treat the underlying cause, whether infection or allergy'. The inclusion of thonzonium bromide is said to secure 'exceptional penetration'. Available in plastic atomizers each containing ½ fluid ounce (15 ml.). (William R. Warner & Co. Ltd., Eastleigh, Hampshire.)

'DETIGON' antitussive drops consist of a 'highly effective cough-suppressing substance' which chemically is said to be basically different from all existing drugs for the relief of cough. Each millilitre contains 50 mg. of the active ingredient, 1-o-chlorphenyl-3-dimethylamino-1-phenylpropan-1-ol hydrochloride. Issued in drop-bottles of 10 ml., and dispensing bottles of 50 ml. (Levmedic Ltd., 37/41 Bedford Row, London, W.C.1.)

'DROXALIN GEL' contains equal parts of aluminium hydroxide and magnesium trisilicate, and is intended for use in the treatment of peptic ulcer and hyperacidity. It is said that a single teaspoonful (3.5 ml.) will neutralize 50 ml. of hydrochloric acid in two minutes. Supplied in bottles of 8 and 80 ounces. (Scott & Turner Ltd., Andrews House, Newcastle upon Tyne, 1.)

'ELIMIT' tablets each contain 1 mg. of reserpine and 50 mg. of orphenadrine hydrochloride and are intended for the treatment of acute and chronic psychoses, particularly schizophrenia. The combination of these two drugs is said to 'eliminate the troublesome side-effects' produced when reserpine is given alone, without detracting from its therapeutic value. Available in bottles of 100 and 500 tablets. (Camden Chemical Co. Ltd., 61 Gray's Inn Road, London, W.C.1.)

'EVRAMYCIN' contains triacetyloleandomycin, a new chemical modification of the antibiotic oleandomycin, and is said to be 'safe, consistent and remarkably effective against the majority of bacterial infections met with in practice', especially in those due to strains resistant to the commonly used antibiotics. The high urinary concentration achieved makes it 'particularly valuable' in the treatment of urinary-tract infections due to sensitive organisms. Available as a suspension containing 125 mg. in each 5 ml., in bottles of 60 ml. with 5-ml. plastic spoon, or as 250-mg. capsules in bottles of 12 and 100. (John Wyeth & Brother Ltd., Clifton House, Euston Road, London, N.W.1.)

'FEBRILIX' is a liquid analgesic and antipyretic preparation for children, each 4 ml. of which contain 120 mg. of paracetamol. It has been prepared to overcome the difficulties of giving tablets to children, and is said to be a stable, palatable elixir. Supplied in bottles of 70 ml. (Boots Pure Drug Co. Ltd., Station Street, Nottingham.)

'PLANIDETS' antiseptic-analgesic lozenges each contain 1 mg. of dibromopropamidine embonate, 1 mg. of chlorphenoctium amsonate, and 4 mg. of butylaminobenzoate, and are intended for the relief of painful conditions of the mouth and throat and as an aid in the treatment of throat and mouth infections due to susceptible organisms. They may be used both prophylactically and curatively. Their local analgesic effect is said to make them 'particularly useful' in relieving the discomfort of a sore throat and in soothing irritated tissues. Issued in tubes of 12. (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham, Essex.)

'TRIOMINIC' 'time-release' tablets each contain 50 mg. of phenylpropanolamine hydrochloride, 25 mg. of mepyramine maleate B.P. and 25 mg. of pheniramine maleate, and quick relief, lasting six to eight hours, from symptoms of the common cold and nasal allergies is said to be provided by one tablet given orally. Available in bottles of 50 and 250 tablets and as 'triominic syrup' for children and infants, each teaspoonful of which contains one-quarter of the dosage contained in one tablet (bottles of 2 and 20 fluid ounces). (A. Wander Ltd., 42 Upper Grosvenor Street, Grosvenor Square, London, W.1.)

PHARMACEUTICAL NOTES

ARMOUR LABORATORIES announce the introduction of 'gastrolav' capsules, each of which contain 7 mg. of lyophilized *a*-chymotrypsin. These are intended for diagnostic gastric lavage, and are available in bottles of 12 capsules. (Hampden Park, Eastbourne, Sussex.)

BIOREX (MARKETING) LTD. announce that their preparations marketed under the name of 'biacnyl' will in future be known as 'blaknesol'. (47-51 Exmouth Street, Rosebery Avenue, London, E.C.1.)

DUNCAN FLOCKHART & CO. LTD. announce that a new edition of the price list of their pharmaceutical products is now available upon application to them at 16 Wheatfield Road, Edinburgh 11.

TRUFOOD LTD. announce the addition of a new fruit purée, 'golden plums with cereal and honey', to their range of strained and homogenized foods for infants. Suitable for infants from the age of 4 or 5 months. (113 Newington Causeway, London, S.E.1.)

NEW APPARATUS

A LIGHTWEIGHT OXYGEN SET intended primarily for use in the home is now being marketed by British Oxygen Gases Ltd. The oxygen is breathed through a 'polymask' inhaler made from transparent plastic material, which is discarded after use. A new-style pressure regulator enables oxygen to flow at either 2 or 4 litres a minute and is said to operate over long periods without attention. (Medical Division, Brentford, Middlesex.)

The 'LIMPET' and 'RETAINER' models of the 'helping hand' have been produced for those whose hands are so badly incapacitated that they cannot even work the trigger of the normal model in the usual way. The former will clip on to a stick, crutch or wheel-chair, and the latter retains objects until released and works without moving the fingers. (The Helping Hand Company, Bransgore, Christchurch, Hants.)

FILM NEWS

Atrial Septal Defect (16 mm., colour sound; running time 35 minutes) was made in collaboration with the departments of cardiology, thoracic surgery and anæsthetics at the Middlesex Hospital, and shows the operation for restoration of normal heart function in a girl aged 17 years. Radiographs, electrocardiograms and cardiac catheterization findings are shown, as well as the procedure of premedication and induction of anæsthesia and the technique of hypothermia. The stages of operation are shown in detail and the patient is seen three months after operation when she is able to return to work and live a completely normal life. Arrangements will be made to show the film to medical, pharmaceutical and nursing groups upon application to May & Baker Ltd., Dagenham, Essex, or any of their associated companies.

Prostatectomy Under 'Fluothane' (16 mm., colour, sound; running time 11 minutes) shows the advantages of 'fluothane' anæsthesia in obtaining a bloodless fiield in prostatectomy operations. The 'fluothane' is given in a closed circuit, and a new method using a Rowbotham's vaporizer is introduced and discussed. (I.C.I. Film Library, Imperial Chemical House, Millbank, London, S.W.1.)

Simplified Urine Analysis (16 mm., colour, sound; running time 20 minutes) provides simple instruction in the use of the range of reagent strips and tablets issued by the Ames Co. (London) Ltd., from whom the film is available on request to Nuffield House, Piccadilly, London, W.1.

La Presse Médicale announce that the 'annual prize for medico-surgical cinema', comprising 100,000 Fr. (which may be divided) and various other prizes, will be awarded during the last session of the course of 'Actualités médico-chirurgicales' to be held in Paris in March 1959. Any 16-mm. film may be submitted, the latest date for receipt of entries being February 15, 1959. Full details may be obtained from the Secretariat, *La Presse Médicale*, 120 Boulevard Saint Germain, Paris VIe, France.

ROYAL SOCIETY OF MEDICINE

THE next meeting of the Section of General Practice will be held at 8.15 p.m. on Wednesday, December 17, when the following papers will be read: 'Electronic Devices', by Dr. D. G. French; 'Wedge Photometers' by Dr. T. S. Eimerl; 'Tape Recordings in Postgraduate Education' by Dr. J. C. Graves; and 'Bornholm Disease' by Dr. W. O. Williams.

FORTHCOMING CONFERENCE

The Elderly in the Community will be the subject of a conference organized by the Central Council for Health Education to be held on January 22, 1959, in the Great Hall, B.M.A. House, Tavistock Square, London, W.C.1. Further details may be obtained from the Medical Director, Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1.

PRIZES

The *American College of Chest Physicians* is offering three cash prizes for the best essays by undergraduate medical students on any phase of the diagnosis and treatment of chest diseases (cardiovascular or pulmonary). Entries must be submitted by April 15, 1959. Application forms may be obtained from the Executive Director, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois, U.S.A.

ROYAL NATIONAL INSTITUTE FOR THE BLIND

AMONG the many activities of the Royal National Institute for the Blind the school of physiotherapy continues to maintain its high standard in the training of students from many parts of

the world. The annual report for the year ended March 31, 1958, shows that 15 students qualified as members of the Chartered Society of Physiotherapy during the year, and some idea of the student's task in assimilating knowledge through the fingers is gained by the realization that 'Gray's Anatomy' alone comprises thirty-three volumes of embossed type. In an effort to make easier both reference and initial study, plans are in operation for the compilation of tape recordings of some of the fifty-four separate works which the school's library now contains. This is but one of the many ways in which the Institute is striving to ease the burden of those without sight, and total expenditure during the year exceeded £1,000,000. Donations should be addressed to the Royal National Institute for the Blind, 224-228 Great Portland Street, London, W.1.

HELPING THE ELDERLY

In the course of the year over 2000 people have been helped financially by the Distressed Gentlefolk's Aid Association, and the sum of practically £68,000 has been disbursed, according to the annual report of the Association for 1957-58. The construction of the new Home the Association is building in London, which will care for 49 chronically sick men and women, is proceeding satisfactorily, and it is hoped that it will be open next summer. A new residential home will also be opened in Exeter during the course of 1959. This will bring up to a total of seven the number of homes run by the Association. There are waiting lists for all of them, and applications for vacancies should be made to the Case Secretary, Distressed Gentlefolk's Aid Association, 10 Knaresborough Place, London, S.W.5.

THE RETREAT, YORK

To help in the development scheme which involves re-planning of the whole hospital along modern lines, an appeal for £120,000 has been launched. Donations or covenants should be sent to the Honorary Treasurer, The Retreat, York.

ST. THOMAS'S HOSPITAL

According to the annual report of St. Thomas's Hospital for 1957-58, it is hoped that work on the building of the new hospital will begin next year. Preparatory demolition work is already under way and has included the demolition of eighty-three private dwellings and a small section of the garden of the Archbishop of Canterbury. It is reported that the contribution from endowment funds towards the cost of the new hospital will be nearly £3,000,000. That these funds are already being put to good use is exemplified by the fact that during the year they contributed £32,900 towards research, £17,000 for amenities for patients and staff, and £166,000 for hospital reconstruction.

SENSIBLE SLIMMING

Practitioners who wish to have an authoritative summary of the present status of 'slimming cures' either for themselves or their patients would be well advised to obtain a copy of the autumn issue of *Which* ?, the admirable quarterly publication of Consumers' Association Ltd. Copies (2*s*. 6*d*. each, post free) may be obtained from the Association, the address of which is 7 Great James Street, London, W.C.1.

SUDDEN DEATH IN INFANCY

In 1955, sudden deaths in children, aged two weeks to two years, which might have been attributed to suffocation, accounted for just over 20% of the mortality in this age-group in England and Wales. In an interim report presented to the Ministry of Health, which is summarized by A. Leslie Banks (*Monthly Bull. Minist. Hlth Lab. Serv.*, 1958, **17**, 182), it is stated that an analysis of 81 cases investigated in London and Cambridgeshire provides strong evidence in favour of acute respiratory infection being in some way related to sudden death in infancy. On the other hand, the inhalation of food or vomitus is another possible explanation. Mechanical suffocation was considered a possibility in only a few cases. There was no evidence that overlaying was a factor in any of the cases investigated. In only 11 of the cases had the child been seen by a doctor on account of symptoms in the last three days before death. The symptoms often present just before death were such as would give no cause for anxiety: e.g. a slight cold with or without vomiting. Most of the children in this series were put to bed as usual, and a few hours later were found dead or dying.

LIQUORICE EYE-DROPS

Liquorice has been widely used for thousands of years by traditional Chinese physicians. In view of its cortisone-like action, Li Huei-Ch'in and Ch'en Ching-K'ang (*Chin. med. J.*, 1958, **76**, 548) decided to investigate the action of liquorice extract in certain eye diseases. When given orally it was of little value, but its local application is said to be beneficial. In four cases of episcleritis treated with eye-drops of the sodium salt of glycyrrhizinic acid (8 or 12%) the nodules disappeared in three to seventeen days, and the inflammation subsided in six to seventeen days. In five cases of scleritis the nodules disappeared in five to seventeen days, and the inflammation in ten to thirty-four days. In six cases of vernal conjunctivitis the itching was controlled on the second day. Itching recurred

when the drops were discontinued but was relieved again when administration of the drops was renewed. A preparation of sodium salt of 8% of glycyrrhizinic acid is equivalent to 40% fluid extract of liquorice. When the pH is kept neutral there is said to be practically no irritation of the eye.

CZECHOSLOVAK MEDICINE

A GOVERNMENT decree recently published in Prague means that as from next January private practice will practically cease to exist in Czechoslovakia. Hitherto many Czech hospital doctors have supplemented their incomes by building up private practice, but under the new decree, only university professors, leading specialists and retired or invalid doctors already in practice will be given permission to continue their private practice. The decree will also stop the current practice of doctors in private practice being allowed to provide certificates of fitness of patients for work, or recommendations for treatment in public health establishments or spas.

PUBLICATIONS

The Physical Treatment of Varicose Ulcers, by R. Rowden Foote, M.R.C.S., L.R.C.P., D.R.C.O.G., is really an instructional manual for physiotherapists and nurses who have to undertake the treatment of ulcerated legs. Within this limited scope it is admirable—being short and profusely illustrated. Part 1 explains very simply the anatomy and pathology of leg ulcers. There is unnecessary confusion in attempting to differentiate between 'venous' and 'varicose', and 'gravitational' and 'post-phlebitic', ulcers but on the whole this part is simple and clear. In part 2 the detailed techniques of treatment by pressure bandaging and Bisgaard massage are given. These are well described and illustrated. Perhaps the only criticism here is that all the various techniques are so well and fully described, that one is left with the impression that the patient with an ulcer of the leg has a full-time job for life. This, however, is a somewhat frivolous criticism of a book which is valuable to the nurses and masseuses for whom it is written.

The fundamental criticism of the book is that the fact that nearly all ulcers of venous origin can be, and should be, cured by adequate surgery is not really emphasized enough. It is in the preoperative and postoperative treatment that the techniques described in this book hold their most valuable place. After successful surgery the somewhat tedious 'new way of life' described here is unnecessary—and the patient can go back to her more enjoyable way of life. (E. & S. Livingstone Ltd., price 15*s*.)

Cardiac Problems for Chest Physicians.—This little publication is based on a symposium on cardiovascular disease under the chairmanship of Dr. K. Shirley Smith. The differential diagnosis of cardiac and respiratory disease is clearly explained and in subsequent contributions emphasis is rightly placed on heart failure in chest conditions. The methods of distinguishing between pulmonary hypoxia and pulmonary hypertension are clearly explained, and the accounts of heart failure, chronic cor pulmonale and pulmonary hypertension are concise and helpful. It is unfortunate that Mr. T. Holmes Sellors' contribution on the techniques of modern cardiac surgery should not be included in the symposium, for even in an abbreviated and summarized form, this would have afforded much valuable additional information. (National Association for the Prevention of Tuberculosis, price 5*s*.)

Collected Papers of the Mayo Clinic and the Mayo Foundation, vol. 49, edited by Richard M. Hewitt *et al*.—The Mayo Clinic papers are not only essential for every medical library, but have a wide appeal to those engaged in consultant practice, clinical research and to many general practitioners. This latest collection of them maintains the high standards of its predecessors. (W. B. Saunders Co., price 91*s*.)

Dietitians at Work is a leaflet prepared by the British Dietetic Association which gives a brief account of the posts open to dietitians in hospitals, the social services, industry and teaching. (251 Brompton Road, London, S.W.3.)

Glasgow's X-Ray Campaign against Tuberculosis is the official, lavishly illustrated report of the campaign in which, earlier this year, Glasgow beat all world records with a proud total of 719,915 attendances. (The Corporation of Glasgow, City Chambers, Glasgow, C.2.)

OFFICIAL PUBLICATION

Annual Report of the Chief Inspector of Factories on Industrial Health for the Year 1957.—This is the first occasion on which the chief inspector of factories has published a separate annual report on industrial health. The move is a welcome one as previously the items in his report of interest to practitioners tended to be lost amid all the other data which had to be covered. In this new form the report on industrial health will be of interest to all practitioners in industrial areas. (H.M. Stationery Office, price 3*s*.)

INDEX

The index to Vol. 181 (July-December, 1958) will be forwarded to all subscribers with the January issue.

NOTES FROM THE CONTINENT

FRANCE

Phenylbutazone in superficial phlebitis.—As a result of their experience in a series of 33 patients with superficial phlebitis, C. Bourde and P. Bernard conclude that this is a most satisfactory method of therapy. Its two great advantages are its speed of action and its ease of administration. The method of administration which they have found most satisfactory is in the form of a suppository containing 250 mg. Their dosage was two suppositories daily for three days, and then one daily for the next four or five days. No serious side-effects were encountered.

Neonatal thrombocytopenia.—The possibility of a thrombocytopenia being a contributory factor must be considered in all cases of petechial eruptions in the neonatal period, according to D. Alagille and D. Ménaché. In discussing the etiology they emphasize the importance of excluding in the first instance some intra-uterine infection such as herpes and generalized cytomegalic inclusion disease. In other cases it may be associated with congenital toxoplasmosis, congenital syphilis, or neonatal septicæmia. They suggest, however, that most commonly the condition is secondary to a maternal thrombocytopenia, and in such cases the condition disappears spontaneously before the end of the third month. Rarely it may be due to some hæmatological disturbance such as acute congenital leukæmia. Another rare cause is congenital absence of the megacaryocytes in the bone marrow; this may occasionally occur in conjunction with Fanconi's syndrome.

Peritoneoscopy.—As a result of their experience in 34 cases, M. Girard and M. Coulot conclude that peritoneoscopy is a safe and satisfactory procedure which should be used in the diagnosis of all difficult cases of ascites. There are practically no contraindications to its use. They have found it of particular value in cases of cirrhosis of the liver: not only does it allow a correct diagnosis to be made, but it is also of value in giving a satisfactory prognosis. The other two conditions in which it is of most value are ascites due to a tumour which cannot be detected clinically, and ascites resulting from tuberculosis of the peritoneum. In the case of the former it provides definite information as to the site of the tumour and the extent of metastases. In the case of tuberculous peritonitis they go so far as to say that peritoneoscopy is essential for diagnosis, one of its advantages being that it detects the primary site of infection should this be present in the gastro-intestinal tract.

Respiratory re-education in emphysema.—In patients with emphysema in whom cardiac function is beginning to be affected, A. Tourniaire and his colleagues report that much benefit can be obtained by respiratory re-education. Normally inspiration is active and expiration is passive. The method recommended by Tourniaire and his colleagues is to train the patient to reverse this process and make expiration the active phase. In a series of ten patients they have found that this procedure increases blood oxygen and reduces blood CO_2 levels. A further advantage of the method is that it can be carried out by patients without undue physical exertion.

Plasma proteins in duodenal ulcer.—As the result of a survey of the world literature on the subject, R. Dupuy and A. Beaune report that there is a disturbance of the normal protein content of the blood in duodenal ulcer, but that this varies from one country to another. This disturbed protein balance persists even during periods of remission. In Metropolitan France there is an increase in the plasma proteins due to an increase in the albumin, whereas among French Moslems the total protein level is very variable but there is always an increase in the globulin fraction. In North America the plasma proteins are diminished, but in Russia they are increased. In the case of the Italians there is usually a decrease in the albumin fraction.

A diabetic survey.—R. Boulin and H. Chimene have carried out a two years' survey of the incidence of diabetes mellitus, based upon blood sugar estimations. This investigation revealed an incidence of 15% of diabetics and 20% of 'para-diabetics'. In 60% of these individuals a hereditary factor was discovered, this being three times more common on the maternal side than the paternal side. Two-thirds of the individuals were overweight. As a result of their findings they suggest that the glycosuria of pregnancy is much more commonly an indication of incipient diabetes than is generally considered to be the case by obstetricians. In 60% of these cases recognized before there were any clinical manifestations of the disease, they found that simple dietitic measures brought the condition under control, and they suggest that this is because they reduced the strain on the poorly functioning pancreas and thereby allowed it to maintain an output of insulin which was sufficient to cope with the restricted carbohydrate intake.

GERMANY

The problem of bacterial resistance.—At the recent 100th meeting of German scientists and physicians, A. Wacher discussed the problem of chemotherapy and bacterial resistance. His most interesting thesis was that, if it is possible to make sensitive organisms resistant, then it should also be possible to make these resistant organisms sensitive again. So far it has only proved possible to postpone the development of resistance by the skilled use of combined therapy. There is, however, some experimental evidence to show that with certain bacteria it is possible to overcome this resistance and make them sensitive again by the use of an extract of cells sensitive to the inhibitory substance. If this work is confirmed on a larger scale, it may provide a means of overcoming this hazard of the antibiotic age.

Preservation of human milk.—The advantages of refrigeration, as opposed to sterilization by heat, in the preservation of human milk have been reviewed by C. M. Sagar. Its great advantage is that it does not lead to any change in the quality of the milk. The enzymes, for instance, retain practically their full potency: amylase is hardly affected, and the activity of lipase is only diminished by about 10 to 15%. The vitamin B_2 and B_{12} contents remain unchanged, and there is no adverse effect on the antibodies.

Pulmonary tuberculosis.—Although the mortality from pulmonary tuberculosis in Federal Germany has fallen to 1.9 per 10,000, the number of cases of open tuberculosis is still unpleasantly high: 21 in every 10,000 of the population. It is estimated that there are now 140,000 patients with open tuberculosis, of whom only about a third are in sanatoria.

'Baby-hotels' and 'Sunday fathers'.—The problem of an undisciplined rising generation is causing as much anxiety in Federal Germany as in other Western communities, and the subject has been discussed in several articles in the German medical press during recent months. The two factors held primarily responsible are the increasing tendency for mothers to go out to work and the poor example set by adults. Since 1939 the number of women in employment has grown by 41%, and it is estimated that one in every four of the children in Federal Germany 'lacks motherly care'. In the large cities the proportion is even higher. Even the presence in the house of an infant in arms does not deter the mother from going out to work, and her neglect of the infant is encouraged by the provision of what have come to be known as 'baby-hotels' in which the unfortunate infant is lodged while mother goes out to work.

It is not only the mother who is at fault. Fathers, too, are seldom at home during the week. The pace of life is such that many of them have two jobs and often work at a distance from their homes. They have therefore become what are popularly known as 'Sunday and holiday fathers'. One well-known pædiatrician has expressed the view that the time has come to call a halt to the barrage of psycho-analytical tests to which children are being submitted and pay more attention to trying to ensure that they are provided with a reasonable home life. It is the same pædiatrician who expresses concern at the deleterious effect upon children of the increasing extent to which their mental and emotional development is being affected by radio, television, and certain types of magazines.

So far as adolescents are concerned, the blame again is laid fairly and squarely upon the shoulders of adults. According to H. Hoske, 'youth is neither good nor bad, but simply a mirror of the adult world'. It is for adults, he contends, to give up their endless pursuit of the luxuries of civilization and to allay the unrest and fear which they are allowing to dominate their lives and affect their behaviour. He deprecates the American influence of the 'job', to which he attributes much of the present tendency for the young to fail to settle to a given profession or occupation. The ethics of work are being subjugated to mere money-making, in that it is the latter which is tending to become the primary consideration in deciding upon one's future. Pride of work is being subordinated to the size of the wage-packet.

So disturbing is the position that one writer has gone so far as to suggest that, if parents are not prepared to realize the dangers and take action accordingly, then it may be necessary for the State to intervene and alter the laws of the land so that it will not be possible for mothers to sacrifice their children on the altar of the Golden Calf.

'Notes from the Continent' are produced in collaboration with the Editors of Bruxelles-Médical (*Belgium*), La Revue du Praticien (*France*), Münchener Medizinische Wochenschrift (*Germany*), and Minerva Medica (*Italy*).

THE PRACTITIONER

Fifty Years Ago

'The Past is like a funeral gone by, The Future comes like an unwelcome guest'.
—Edmund Gosse, *Sonnet: May-Day*

DECEMBER 1908

'THE present number completes the eighty-first volume of *The Practitioner* and rounds off another year's work. It is an appropriate time for taking what we once heard a preacher with the gift of pleonasm term "a retrospective glance backwards over the past"; and we trust that all

Pierre Janet (1859-1947)

our subscribers can survey the past twelve months with as much satisfaction as ourselves. Our hearty thanks are due to the many men of eminence in various branches of the profession who have contributed the results of their scientific researches and the fruits of their clinical experience to our pages, and we have also to thank our subscribers who have signified their kind appreciation of our endeavours'.

One of the subjects discussed at the Washington Congress on Tuberculosis was sanatorium treatment. 'The policy of overfeeding found few friends, and the doctrine that all consumptives must be kept at rest was renounced. The ends to keep in view in directing the treatment of tuberculosis are the improvement of the patient's general health, and the raising of his muscular tone. It does not follow that, because a good appetite is a sign of good general health, the undue forcing of the appetite conduces to it; and there is nothing which raises the muscular tone like exercise, provided, of course, that it is the right sort of exercise and rightly regulated. The Brompton Hospital Sanatorium is now working, with good results, on that hypothesis. Light work, and even in suitable cases, hard work, are often prescribed there. It is found that work, in addition to its specific direct effect on the muscles, has a valuable indirect influence upon the mind. It prevents patients from worrying, and the cases in which work is more deadly than worry are very rare indeed'.

The 'Original Communications' this month are not particularly interesting or of historical importance. E. H. Colbeck, M.D., F.R.C.P., Physician to the City of London Hospital for Diseases of the Chest, discusses 'The Pathogenesis of Arteriosclerosis'. A cardiologist of the old school, Colbeck 'put his faith in a good ear and experience rather than instruments'. A keen golfer, he wrote *The Golfer's Swing* under the pseudonym 'The Burnham Hare'.

E. Stanmore Bishop, F.R.C.S., Hon. Surgeon, Ancoats Hospital, Manchester, describes 'The Evolution of the Modern Operation of Hysterectomy', and Lawrie McGavin, F.R.C.S., Surgeon to the Dreadnought Hospital, contributes an article entitled 'The Radical Cure of Complete Procidentia of the Uterus, with an Account of a new Method of Operation for this Condition'.

Hugh M. Rigby, M.S., F.R.C.S., Surgeon in Ordinary to The Prince of Wales, and Assistant Surgeon to the London Hospital, reviews 'Forty-Six Consecutive Cases Operated upon for Cholecystitis', and B. G. A. Moynihan, M.S., F.R.C.S., Surgeon, Leeds General Infirmary, deals with 'Cholelithiasis: its Early Recognition and Early Surgical Treatment'.

In his article, 'Industrial Diseases', Alexander Scott, M.D., Certifying Factory Surgeon, Medical Referee for Industrial Diseases, describes lead poisoning as 'the most prevalent of all industrial diseases. During the year 1907, there were notified to the Home Office no fewer than 578 cases, of which 26 were fatal'.

In 'A Review of Dental Surgery', J. G. Turner, F.R.C.S., L.D.S., Dental Surgeon and Lecturer on Dental Surgery, Royal Dental Hospital, London, refers to D. M. Paton's advocacy of the use of antidiphtheritic serum for such dental conditions as injury, pain after

extraction, and pericementitis, and to his explanation of its action in Ehrlich's terms, 'the serum supplies the immune body, and the tissue fluids the complement'. Mention is also made of Sim Wallace strongly condemning 'the pap-feeding of children recommended by many authors at the period of weaning. He urges that solid bread or toast which the child sucks and slowly chews is a far more rational diet'.

In 'A Note on the Diagnosis of a Fracture' R. P. Crosbie, M.B., B.Ch., Surgeon for Out-Patients, South Infirmary, Cork, writes: 'In the professional life of all of us . . . we sometimes meet a case, in which, from a legal, from a social, or a professional, point of view, it becomes of extreme importance for us to decide on the question of fracture or non-fracture of a bone. . . . To put the case briefly, every bone offers a certain resistance to the touch, on examination, which is the measure of its rigidity. The slightest fracture at once interferes with this rigidity, and, to the close examining finger, the bone is no longer rigid but yielding. . . . It is surprising to see how quickly students take to the method, for, even they sometimes feel disgusted, on seeing a large class inflicting the more painful methods on a patient. Personally I never feel for crepitus, and yet deal with a large number of cases on these lines'.

'The Edinburgh Stereoscopic Atlas of Obstetrics' by G. F. Barbour Simpson and F Burnet is welcomed 'as a very important addition to our teaching power'. 'Injuries of Nerves and their Treatment' by James Sherren 'contains a concise and complete, though not exhaustive, account of the subject . . . based on an extensive personal experience'. Historically the most interesting book reviewed this month is 'The Major Symptoms of Hysteria' by Pierre Janet: 'Dr. Janet is evidently an enthusiast in the study of Psychology, and has embodied much useful information in his lectures, the style of which is captivating, but slightly too declamatory to be of the best didactic form . . . out of a wide experience, and, as a result of careful observation and reflection, the author . . . has advanced theories, and formed conclusions, which merit the thoughtful consideration of all medical practitioners'. Pierre Marie Félix Janet, the centenary of whose birth occurs next year, was for long the dominating figure in French psychology and psychiatry. He graduated Ph.D. in 1882 and M.D. in 1893, and for many years was professor of psychology at the Collège de France. He is best known for his writings on hysterical states, the obsessional neuroses, psychological automatism, and psychasthenia, which he was the first to describe.

W. R. B.

ST. ANDREWS HOSPITAL, NORTHAMPTON

FOR NERVOUS AND MENTAL DISORDERS

President—THE EARL SPENCER

Medical Superintendent—THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders, or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. There is an Operating Theatre, a Dental Surgery, an X-Ray Room, an Ultra-Violet Apparatus, and a Department for Diathermy and High-Frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit-growing.

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The seaside house of St. Andrews Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan amidst the finest scenery in North Wales. On the north-west side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change, or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, &c.

For terms and further particulars apply to the Medical Superintendent (Telephone: No. 4354, three lines, Northampton), who can be seen in London by appointment.

Supplement to THE PRACTITIONER—*December* 1958

THE COLLEGE OF GENERAL PRACTITIONERS

(*Founded November* 19, 1952)

41 CADOGAN GARDENS, SLOANE SQUARE, LONDON, S.W.3

Sixth Annual Report—1958

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Report of the Fifth Council

I.—PROGRESS DURING THE PAST YEAR

The Fifth Annual General Meeting

The fifth annual general meeting of the College was held in the Great Hall of B.M.A. House in the afternoon of November 16, 1957, with Dr. F. M. Rose (Chairman of Council) presiding. About 200 members and associates were present.

Dr. Ian Dingwall Grant (Glasgow) was unanimously re-elected President; he took the chair for the presentations. The Fifth College Council was appointed, consisting of 35 faculty representatives and 12 elected members.

The Butterworth Gold Medal was awarded to Dr. A. Fraser-Darling (Grantham, Lincolnshire) for his essay entitled 'The Science and Art of Prognosis in General Practice' (*J. Coll. gen. Pract.*, 1958, **1**, 129). The presentation was made on behalf of Mr. J. W. Whitlock (Messrs. Butterworth & Co. Ltd., Medical Publishers).

Certificates for 15 *Upjohn Travelling Fellowships* (£200 each) were presented by Mr. J. A. Braun (Upjohn of England Ltd.) to the following members of the College:

J. F. Burdon (Paignton, Devon), D. L. Crombie (Birmingham), R. S. C. Fergusson (Lochinver, Sutherland), S. Freeman (Manchester), J. C. Graves (Writtle, Essex), W. G. Keane (Dartmouth, Devon), C. W. Kidd (Belfast), A. U. MacKinnon (Leeds), E. G. L. Mark (Macclesfield), R. A. O'Shea (Pinxton, Notts.), O. Plowright (London), W. G. Tait (Reading), C. A. H. Watts (Ibstock, Leics.), W. T. Westwood (Stretford, Lancs.), D. G. Wilson (Bushey, Herts.).

Six *Public Welfare Foundation Prizes* (£40 each) were handed by the President to the following final-year medical students:

E. T. L. Davies (St. Mary's Hospital Medical School, London), G. H. Farrington (University of Leeds Medical School), Florence McCallum (University of Edinburgh Medical School), Lilian Orba (University of Edinburgh Medical School), D. A. R. Robertson (University of Edinburgh Medical School), R. N. Smith (University of Birmingham Medical School).

The college bye-laws were amended by special and ordinary resolutions; and five resolutions from faculties were discussed.

The Fourth James Mackenzie Lecture

On the morning of the annual general meeting, Dr. D. M. Hughes (St. Clears, Carmarthenshire) delivered the annual James Mackenzie Lecture to an audience of about 300 members, associates, their families, and friends. The title he chose was 'Twenty-Five Years in Country Practice'. Everyone present enjoyed his philosophical, poetical, and amusing description of his early years at work in Wales—his 'peep into the country' when he joined a partner aged 83 in 'the good old days which were not all good'. He also gave his impressions of medicine in England and Wales at present; and he told of his hopes for the future of family doctors, and for the revitalizing influence of the College on general practice (*The Practitioner*, 1958, **180**, 93).